

Educational Supplement

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Break

Red on blue

Red faces at the launching of *Rape of Reason*, the right-wing book by North London Polytechnic's years of struggle published by Rhodes Boyson.

Caroline Cox, one of the editors, definitely not a right-wing, but a left-wing, proved how civil the students were by handing out a copy of the students' union handbook for last year. There, on the cover, for all to see, was the famous demonstration at the poly's inauguration ceremony at Queen Elizabeth Hall (see page 10).

Now passed into student mythology as the "denigration ceremony" 200 students completely disrupted the event, drowned out the opening speeches and left Norman St John Stevas, the main guest, queuing and distraught.

Students were so proud of their success that they plastered the demo all over the front and back covers of their handbook. And that proved, according to Mrs Cox, how thoroughly nasty they were.

Police coughs and exchanged smiles from the representatives of the bourgeois capitalist press. Was not the handbook cover the same photograph as that on the front of *Rape of Reason*? Confusion among the audience but publisher Boyson came rapidly to the rescue. "Yes, but we've turned the tables on them," he said.

One that got away

Red faces, perhaps, at the Daily Express too (and if there were not, there should have been because of the "apocalyptic" they missed to drive home the message). A front page story last week described Terry Povey as Britain's leading revolutionary student leader who spent seven years at North London Polytechnic whipping up moderate students, rigging meetings and examinations and if he had been given half the chance, spending money on an armoured personnel carrier for the Hendon Gay Liberation Front (get the tone of the Express). It is a teacher failed to qualify as a teacher because he handed his essays in three days late.

Povey, whose wife was described by the Express as standing in front of giant pictures of Karl Marx,

Trotsky, Lenin and Ho Chi Minh, is now seeking a job on the buses.

What the men from the Express did not realize was that on the day head teacher Terry Ellis and six of his staff set up a picket line outside William Tyndale School in North London, Povey was outside the school with other International Socialists, giving moral support to the strikers.

Still, Povey's story was positioned only centimetres away from the Tyndale saga, which, even if you did not spot the international conspiracy, always ensures guilt by association.

Fighting to select

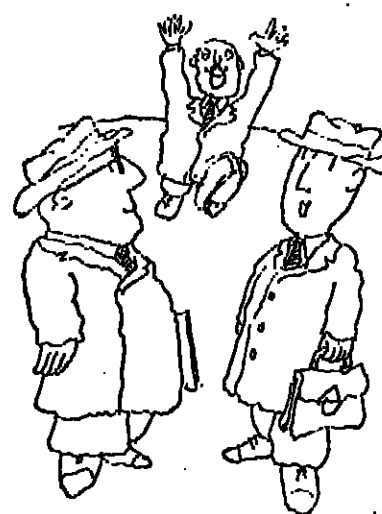
English secondary problems do not look too bad to Barton Knowles, who recently retired as principal of the San Francisco senior high school that won federal case allowing it to select students by ability. "There's a respect for learning in the culture here, and parents seem to expect kids to conform to the expectations of the teachers."

Knowles grew up in, and has worked in, what he describes as "the worst school system in the country". He ran a purpose-built desegregated high school for some years—full of blacks who did not want to be there, and whites who did not want to have them—before moving to Lowell, San Francisco's famous academic high school.

As the population of the catchment area changed, with middle-class families moving out to the suburbs, Lowell had started selecting by ability. They "sifted off" slightly to maintain some kind of sex and race balance—boys were favoured over girls, who were higher on average, and blacks and Spanish Americans were favoured over whites and Chinese.

The result was that they were taken to court by a coalition of different groups—women's groups, because girls were being discriminated against, and racial groups, because ability grading excluded them from being admitted in proper proportions to their numbers in the city population. The case, *Berkelman et al v S.F. Unified School District*, was fought up the courts, with a large defence fund collected by Lowell supporters and alumnae, and in 1974 the United States Ninth Circuit Appeal Court upheld the school's selectivity, but ruled that girls with higher grades must be admitted whatever happened to the sex balance.

Knowles was in England this summer partly for fun and partly to visit schools. "I was interested to see what happens here when a school loses kids with motivation—or at least acquiescence in the purposes of the school." In the case of a strong impression that English problems are much less difficult than American problems, he left "worried that people here assume that we can just go on forever, and do right by every-



"I do believe he's found a job for James."

body. I see no articulated and programmatic statements of how you do it—for instance, what do you do with more mixed ability groups?"

He was reminded he said, of the way desegregation has been handled in the United States: a lot of bodies are moved around, but there is no insistence on school programmes and practices which might foster real integration.

Under him, Lowell became a pretty experimental school, by San Francisco standards. They went in for flexible timetabling, breaking away from the seven 45-minute periods of the minimal schedule. "We were the first school in the Bay area to do our timetable manually," he says proudly.

They abolished hall passes; when students weren't timetable, they could do what they liked, including riding on the grass with their girls. They made timetable time for teachers to be in more informal contact with students.

Some teachers didn't like the freedom of the choices. "Professional freedom and individual responsibility are painful things," some wanted to know and themselves teaching up there at that desk. But a lot of them even at Lowell, would have given up a real bad time if the school hadn't changed its atmosphere.

He says the trouble with reform is and he fears this applies to comprehensive reform is that a lot of kids are being sacrificed. "Kids are being deluded that learning's an easy road, they're being given responsibility, as you can read well, but you know how to get along with people. People say they don't want to 'hassle' kids—but that means they are not expecting much from them. Good teachers—people who know where a kid is intellectually and how they can help him to deal

with the subject matter better—are becoming demoralised in many high schools.

"Sure, a lot of kids were also sacrificed in the old system. But you don't have to substitute a bad system for a bad system. I believe in Lowell, but I would take the risk of going comprehensive—if I really thought people had a chance of doing right by kids at all levels."

At the sign of the furry worm

The Puffin Club has a rival. E. J. Arnold and Heffers of Cambridge have combined to form the Book-worm Club, a similar organization that will work through schools to provide paperback books for the eight-to-12-year-olds.

It differs from Puffin in that initially four publishers—Arnold/Lions, Piccolo, Knight and Carmel—will be represented in the selection of 20 books offered twice a term, and "others are welcome to join", including Puffin, of course.

The nub of the matter is the choice of books. The publishers draw up a list of reliable sellers and send this to Heffers who choose a cross-section. The result is that as well as information books, new novels and "classics" (Kipling and *Black Beauty* this time), *Higgles*, *Star Trek* and *The Famous Five* are represented. Using popularity as a criterion of choice (and thus ensuring large returns) is considered a virtue.

Susan Stranks, the first president (a nice lady with a touch of Julia Andrews and all the friendly authority of an ex-president of Muggie), declared it an impertinence to tamper with people's reading tastes and confessed a preference at the age of 11 for *Billy Hunter* in Brazil.

Last week's press launch was presided over by a large version of the club's symbol—an alveolar looking, furry, green worm that threatens to metamorphose into a post-Wormie era, children are no doubt capable of identifying with anything if they see its image often enough.

The children get a free service—welcome especially in remote areas where a bulletin, book marks and stickers can be hooked on books. The club gets a 10 per cent discount on books. It is hoped, on books rather than staff room coffee, but there will be no pressure.

But if *Star Trek* is to lead to something other than more *Star Trek* it will still be up to the teacher.

Aristides



School dinners for some

DES may hold an inquiry to find out how many children are going without school lunch. This follows disclosures that at least 100,000 children in England are not getting a school meal. The inquiry will be held by the DES, which has just been set up, and will be held by the end of the year.

It is a reminder of the fact that the school meal is a basic need for many children, and that the government has a duty to ensure that all children have access to a healthy and nutritious meal.

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Students—Sithole warns Britain

The Zimbabwe leader says that Britain must educate all the black Rhodesians now here. But the Government are more likely to let them seek jobs than offer them courses. Mark Jackson reports pages 3 and 6.

The uses of Jimmy Britton

Profile by Virginia Makins of the man who brought new thinking about language into the curriculum page 10.

Guide to the presidential stakes

Sue Cameron reports on form among the many contenders who want to lead the NUT page 14.

Book of the year

A Talkback competition gives teachers an opportunity to turn reviewers page 35.



From Poplar to Belfast

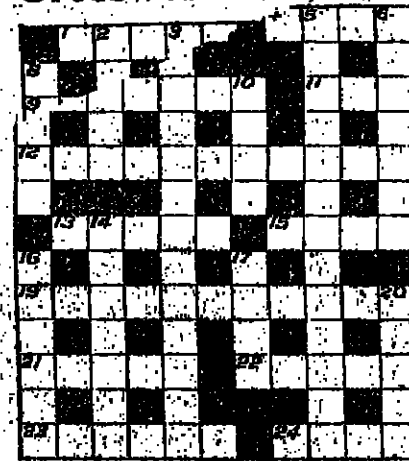
Introducing a new collection of children's writing, Chris Searle links the "ideology of resistance" in Chile, South Africa and Northern Ireland to that of the working class child in English schools page 22.

TES Extra: Science and technology

An integrated approach and changing objectives. With other articles on primary responses, a course for the blind and an A level in electronic systems pages 44-48.

37

Crossword No 1



Across
1. Inhabitant of a hill (4)
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Maths teaser

1. Choose any positive integer not greater than 10, subtract 1, multiply by 10, and add 1.
The sum of the digits of your answer should be the same as the number chosen. Can you explain why this is so?
2. Choose any positive integer not greater than 11. Add the number to 17, and also to 19, and find the product of this pair of numbers. When 1 is added to the product, the result should be a square number. Find its square root, and add its digits. What do you discover? Can you explain this connection between the number chosen and the final answer?
(a) Show that if (m,n) are a pair of integers that satisfy the equation $m^2 + n^2 = 1$, then another pair is $(m+2n, n-2m)$.
(b) Can you find any integral solutions to the equation $m^2 + n^2 = 1$ in which m and n are less than 1000.
Canon D. B. Epston

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The lights are going out all over Blackpool

But this does not get over the question of how to allocate resources equitably and effectively—how to combine attention to needs which flow from high ability with those which flow from severe deprivation. Coexistence as it is now demonstrated in many inner urban areas is not a tolerable solution. There is no status quo to be restored or retained in such circumstances.

Where is the thoughtful political discussion of priorities? Where is the thoughtful analysis of the real meaning and importance of parental choice, apart from its usefulness as a political slogan? Where is the informed political debate on how standards may be improved without recourse to that comfortable cusp—all more cash?



When there is a halt on total growth, more of one thing can only be provided by deciding to spend less on another. There is undoubtedly widespread support among teachers and in the Conservative Party, if not so wide elsewhere, for retaining some measure of selective education.

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No comment

Mr Horner, who has been host of the Willow Tree for seven years, said that he did not want to leave "because of the pleasantness of the masters and there are some very normal folk here as well"—from a Guardian report on the threatened closure of a pub in Eton village.

John 11:16



EDUCATIONAL SUPPLEMENT
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Another brand of soup

Now that the concept of schooling as an instrument of social change has been noisily abandoned by its loudest protagonists, there are already signs that education is suffering a subtle downgrading in its sociological status into a more passive, minor role in the social services.

Whether or not you buy the official concept (which still has some strength, even though the highest hopes have not met instant fulfilment), it is true that the educational and social services overlap. This after all, was bolted on to the official machinery for a joint Framework for Social Policy, shadowed and analysed by the DES earlier this year. But this is not at all the same thing as designating education simply as one of the social services, along with health and welfare, a classification most recently put forward in last Sunday's *Observer* by Mr Eric Midwinter, acting in his new role as social consumer's guide.

Mr Midwinter, of course, has long worked in the overlap area, first with ACE and then with Priority in Liverpool before he joined the National Consumer Council as a project director, which at least ex-

plains his obsession with the social role of schools.

But can it really do education a service to lump it in with health and welfare, as he consistently does, as if it were just another problem area to be cured or alleviated? To do this would be to risk losing sight of the role of learning as an active force in its own right, quite apart from its social quality. The pursuit of knowledge for its own sake, the right to learn, the acquisition of skills, have their own value, different from the right to mass indoctrination and welfare benefits.

It is partly because the state attempts to take over the whole of education—education that it becomes tempting to regard it as just another hand-out. And this makes it all the more important to remember it is something very much more than that.

Eric Midwinter himself warns against the "charitable notion of the social services, the feeling that we should be dumbly grateful for the gratuitous doles of schooling, doctored as well as welfare benefits". He uses this as an argument for a new direction in social consumerism, but it may be that he is selling the pass himself, and certainly selling education short by turning it into an intellectual soup kitchen.

Sticks and carrots

The Science Research Council are right to be worried about the shortage of highly qualified engineers in British industry. But it is hard to see how their proposal to pay higher grants to postgraduate students in "special areas" will make much difference.

The weakness of the present system is not that we need to bribe large numbers of students with first degrees in engineering to stay on to do research. It is the familiar one of an apparent shortage of sixth formers applying for engineering, universities and polytechnics, and choosing science A levels. All the possible reasons are equally familiar.

Higher grants for engineering research would give it an official seal of approval. They might prevent a few students from giving up through hardship, and encourage a few students in related subjects to switch to engineering. But it is unduly optimistic to imagine that a bright 16-year-old, wondering whether to do history or physics A level, will be much influenced by the chance of doing postgraduate research.

The main effect—in the short term at least—would be to reduce

even further the inadequate flow of first degree engineers and technologists into industry. If it means penalising other research students, as it almost certainly will, it needs to be treated with considerable caution for economic as well as educational reasons: should an engineer doing academic research, for example, be paid more than a botanist whose finding might revolutionise agriculture?

A policy of differential grants could, of course, be seen as the first step towards overall manpower planning, but the SRC are obviously not going into the business of making statistical projections of the demands of industry. They are offering the carrot of higher grants with more limited and specific aims. But this is not the answer. The classical economic terms, if industry really needs more top grade engineers it must offer the salaries and conditions of service, however generous, needed to attract them. To expand research studentships without improving the long-term employment prospects in science or technology, generally will merely fill the first few places to the United States.

Turning the world upside down

Stuart Maclure

The education voucher has an enormous appeal to the liberal economic radical. It offers in turn everything upside down without large-scale bureaucratic reorganisation. It suggests a way of altering the balance of power in education without added expense. It betokens radical change, but does not require its proponents to say what kind of change, because by dismantling most of the public mechanisms of educational policy-making and administration, it would hand decisions back to the three or four million families whose children fill the schools.

It is a challenge to the civil servants and local bureaucrats, a method of curbing an overnight teaching profession, and a Pandora's box of unforeseeable innovation. Fear of all, it has just enough of that rational dross to ensure that it is unlikely to prevail against the institutional resistance of a £4,000m education machine at national and local level.

And yet... as the Conservatives should now be scuttling around feverishly for some positive educational thinking, is this the panacea they are looking for? It must be intensely attractive—a promise to initiate a controlled experiment would cost little and would put off more serious decisions for yet another decade.

Vouchers (and student loans) are in the air again this week because of an admirable pamphlet by Alan Maynard, a lecturer in economics at York University, published by the Institute of Economic Affairs. After a brief discussion of the economic arguments for "government intervention in the education market" (which he has little difficulty in rejecting), he goes on to describe a selection of the voucher proposals so far expounded, of which the Jencks, the Friedman, the Peacock-Wiseman and the Coon-Sugarmann schemes are the best known.

He discusses carefully the way in which the state subsidy which the voucher represents can be weighted or taxed according to the social or political objectives underlying any particular scheme. For example, the Jencks voucher is augmented for socially disadvantaged children, while the Friedman voucher is offered at a flat rate for all.

Some schemes would restrict the voucher's use to state schools; others take in private institutions; some can be supplemented by additional tuition payments by parents; others can only be spent at schools which are prepared to live within the resources offered by the voucher.

Some are taxed, others are tax-free. Some are circumscribed by rules about academic selection, racial segregation, social integration; others are based on the conscious discovery that, because education has "failed" as an efficient

instrument of social engineering in the hands of school boards and LEAs, the voucher offers a way to express the "private" nature of education and, therefore, the need in a pluralistic society to offer a genuine variety of individual educational choices.

Of course, Mr Maynard is largely describing paper plans. Of the handful of experimental schemes mooted in the last few years, only that at Alum Rock (not examined in critical detail here) has much experience to draw on, and that is much more limited than any of the blueprints devised by academics.

To a European observer, Alum Rock does seem to have achieved one of the preliminary objectives. The 14 schools (9,500 pupils) which are taking part in the scheme in the Alum Rock school district of San José have each had to change in radical ways. To give parents and pupils a real choice, each school had to offer a range of separate courses—three or four mini-schools, each with its own educational philosophy and curriculum; and separate staff and prospectus as well—and so the parents who live within the catchment areas of the schools can then select a particular combination of school and course.

The result has been to force the schools to review their courses; to offer an "open" primary school course for the parents who want it, and at the same time a "traditional" course for those who want that. Mini-schools are packaged with evocative titles such as "the Little Red School House", "the Learning Odyssey", "self-expression", "great beginnings".

The reality of the consumer-power released by this device can be seen in the movement of choice between options, and the hasty counter-action taken by teachers who suddenly wake up to the fact that their budget butter prefers another mini-school.

But even this needs to be qualified—the anti-teacher philosophy which lurks in the background has had to be modified, because the scheme is dependent on teacher goodwill. The teachers insisted on safeguards against redundancy when they entered the experiment. And as the *New York Times* wryly observed, while vouchers are condemned out of hand by teachers' organisations nationally, "it is the Alum Rock teachers, not the parents, who fear the loss of their most influential authority".

Parental choice takes place against a background of tight state regulations about prescribed standards of achievement at given ages. Movement and choice are still channelled by the school nearest their homes, and some schools are popular in themselves, irrespective of the particular courses they are offering.

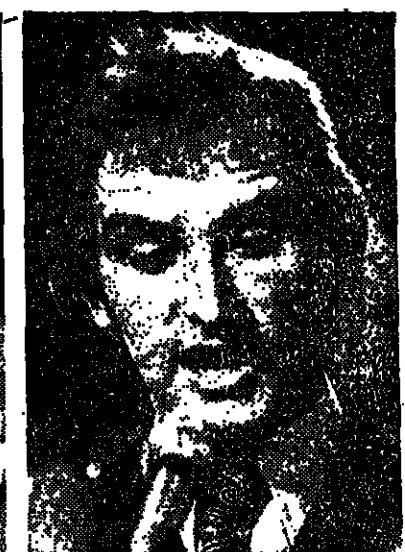
One of the most controversial



Lionel Wood, Miss E. J. Robson, Dr Rhodes Boyson. Bottom row: Mike Forsyth, Joanna Nash, Vaughan reports from the Conservative Party Conference in Blackpool



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Lionel Wood, Miss E. J. Robson, Dr Rhodes Boyson. Bottom row: Mike Forsyth, Joanna Nash, Vaughan reports from the Conservative Party Conference in Blackpool

Conservatives offer a legal arm to protect direct grant schools

The direct grant schools list under the next Education Bill, it will be by statute, Mr St John-Stevens told the Party Conference in Blackpool.

Mr St John-Stevens said the motion expressed the anxieties of millions of parents throughout the country about standards of learning and conduct in schools.

He said the Conservatives' first priority was to strengthen the foundation of the educational system in the nursery and primary schools. "We want to see that every child entering a secondary school system is already able to read easily, to write legibly, spell correctly, add up, and to express himself or herself in good clear English."

As the cornerstone of Conservative policy for restoring the success of the secondary education system, Mr St John-Stevens said the party would reintroduce national standards of literacy and numeracy. Because high standards were so important, the Conservative party had fought hard for the retention of good schools. In the front line were the direct grant schools, which along with the grammar schools provided a ladder of opportunity for children of modest means.

He disagreed with Mr Mike Forsyth of the Federation of Conservative Students that direct grant schools were the preserve of the rich. "They are the preserve of those of modest means—the thrifty, and those who are prepared to make sacrifices for the education of their children."

who are working hard in very difficult circumstances are encouraged to do so, and are not discouraged by constant carping criticism."

Mr R. Neville-Tate from Durham, supporting the motion, criticised the Conservative Party for its feeble reaction to the dark totalitarian developments of the Labour government. He said if a parent used his savings to buy education for his children, then socialists saw him as "a criminal, an outcast of society, a threat to their socialist equality."

Mr Tom Stow from Bradford repeated the loudest applause of any delegate after he had criticized Conservative councillors up and down the country for introducing comprehensive schemes and sweeping away "many of our established and proven grammar schools."

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Letters to the Editor

Sharing the illiteracy cash

Sir—Growing awareness at both government and local authority level that adult illiteracy problems need cash as well as volunteers to help solve them have been emphasized. What amazes a group such as the Herefordshire Experimental Literacy Project is the apparent difference in sharing the financial backing. You report (September 12) that a grant of £2,000 has been made by the Adult Literacy Resource Agency to a project in Herefordshire for 12 volunteers to give individual tuition at home or in group sessions.

HELP is the extension of a successful project started in Hereford

in 1971. Apart from its normal group sessions, it now concentrates on home tuition where fully trained tutors are matched to individual clients. Training courses are held under qualified volunteer staff, there are 25 tutors now working, about 100 more are preparing to take the course, a mobile education centre for work with travelling families will soon be in use, an adult literacy resource centre is available to provide research into the educational and social needs of the disadvantaged.

Herefordshire have one of the highest number of adult illiterates—

Haringey revisited

Sir—In her article "Reflections on Bullock" (September 19) Mrs Wiener purported to use current situations and opinions in Haringey as the basis for her writings. If she had not named the borough, those of us working here would certainly not have recognised that she was writing about Haringey.

Like every other L.A., we shall be inhibited in future developments by current and future shortage of cash, but though we do not take a complacent attitude to the lack of money, we do not see the lack of money as the main reason for our problems.

recommendations are either already under way in this borough, or have started in embryo form. Perhaps my surprise on reading the article was greatest because of the enormous omissions. Nothing was said about a number of projects directly relevant to Bullock which have been under way in Haringey for some time and references to our Language Resources Centre, which incidentally Mrs Wiener did not visit during her brief survey of the borough before writing her article, were far from what I believe is an accurate picture of what the

centre is about and what it is doing. Mrs Wiener left our borough in the United Kingdom 12 months ago, and during a recent visit to this borough she did pay us a visit, but during her absence she had been to Haringey, doing GROVES, ALAI, Education Officers, Borough of Haringey.

More letters, page 12

Black Rhodesians may resist student plan

by Mark Jackson

An inter-departmental plan to provide educational grants for half the estimated 1,500 black Rhodesians who have come to Britain to study will be put to two Cabinet ministers for final approval today.

The plan was agreed in principle at Blackpool during the Labour Party conference by Mr Roy Jenkins, the Home Secretary, and Mr Reg Prentice, the Minister for Overseas Development. Overseas Development will accept responsibility only for students who have found places in colleges; the rest will be left to the Home Office. Most of these are likely to be offered work permits rather than educational courses.

The senior civil servants who have drawn up the plan take the view that those Africans who have not already got places lack the qualifications to pursue their studies within our educational system; and that Britain cannot be expected to lower its standards to accommodate them.

The plan is a compromise which falls a long way short of Rhodesian nationalist demands that Britain should provide appropriate education for all the Africans who come here. Mr Ndabangu Sithole, the Zimbabwe nationalist leader, said on Tuesday, that he and his colleagues were not prepared to see youngsters who had come to Britain to study turned on to the labour market. The whole future of relations between Britain and Zimbabwe would be affected by the way in which the students now here were treated.

It seems clear that the Foreign and Commonwealth Office, who were represented in the inter-departmental discussions along with the two ministries directly concerned—and the Department of Health and Social Security—have seriously underestimated the strength of the feelings of the Zimbabwe nationalist politicians on this issue. Education ranks next to a direct military intervention as the assistance they have most wanted from Britain.

The decision to produce a "sheep and goats" compromise may have been influenced more by administrative considerations than by economic stringency. The cost of providing grants and fees for all 1,500 would be around £2m a year, for which Overseas Development have the funds; but the ministry has been trying to hand over to other bodies responsibility even for students who are already receiving grants.

It is likely that the British Council will, in the end, be given the task of administering the grants and cooperating with the colleges concerned, although they will present the necessary machinery and contacts.

To administer the much wider scheme which would be required to provide everything from O level courses to secretarial training is something which the Ministry could not farm off to the Council—or anyone else, except perhaps the Department of Education and Science. This department, although asked for technical advice by the plan, was not concerned in the discussions.

Interview with Mr Sithole, page 6.



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Rhodesian students: 'a test for Britain'

by Mark Jackson

The 1,500 black Rhodesian students in Britain have become the key issue between the British Government and the Zimbabwe nationalist leaders. The way the Government decide to treat the students could permanently affect future relationships between Britain and a black Rhodesia.

The Reverend Ndabaningi Sithole, the Zimbabwe nationalist leader, told the TES on Tuesday that the African National Council regard the students' treatment as a test of Britain's real attitude towards Rhodesia.

"This is the final chance to prove Britain's sincerity," he said. "You refused us military help against Smith. If you now deny us educational assistance, what is there left?"

At a meeting with Ministry of Overseas Development officials on Tuesday afternoon, just before he returned to Lusaka, Mr Sithole asked the Government to make full educational provision for students already here, and in return he said they would not yet ask for a definite policy decision for those arriving in the future.

But the Ministry discussed only those students who had been accepted by educational establishments—about half the total number of young black Rhodesians who have come here. It was made clear that these were the only ones for whom the Ministry would provide grants, and, as reported on page 3, the rest will be left to the Home Office to provide for. It is likely that most of them will be offered jobs rather than educational courses.

"If the British Government think that we are going to be satisfied with seeing these youngsters turned on to the labour market, they are very wrong," said Mr Sithole. "They came here to learn, not to be unskilled labourers."

He agreed that many of those who had arrived in Britain were not necessarily to be regarded as students in British terms, and they might be seeking training rather

than academic education. "But we are going to need secretaries and technicians in Zimbabwe. They cannot get the education they need in Smith's Rhodesia."

Mr Sithole—17 years a teacher—said that he accepts that the British educational system may not be geared to coping with the needs of young men and women who have been denied all but rudimentary schooling—and who may have to get their O levels here. It might be necessary for Britain to set up special courses to carry out its "repeated pledges" to provide education for the Africans, he said.

He planned to examine the problem in detail with other ANC leaders immediately on his return to Lusaka and to work out proposals to put to the British Government. "Many of us have a long professional experience in education, and should be able to produce some concrete ideas," he said.

The ANC leaders will also discuss their strategy for obtaining educational facilities for young people still in Rhodesia of whom he estimates there are at least 50,000 without jobs and with no prospect of further schooling.

"Most of them are determined to learn by some means—the Smith regime turns them out of school after the seventh grade, which is the equivalent of a British primary education, and they go on studying at home. But they want help, and if they do not get it from Britain they will turn elsewhere."

Mr Sithole said some of the students he spoke to in London this week had asked him whether, in view of their treatment here, he could try to arrange for them to study in China, Russia or Cuba.

"It is inevitable that the others who are still at home will be starting to think along the same lines if it becomes plain that Britain does not want them," he added.

Mr Sithole confirmed that—as reported in last week's TES—a new and major factor behind the migration of teenage Africans from Rhodesia is fear of being illegally conscripted into military service.

"It is not just a rumour—it has been happening since the end of last year. The youngsters are being forced into the army and given



Reverend Ndabaningi Sithole

guerrilla training so that they can be used against us. I think Smith is being very clever since most of them will be fighting against him, but I am not sure of that."

He described as "a major allegation, made at a conference by a prominent member of the National Union of Students, that the Government deliberately encouraged them to come to Britain to be used as a large community of Rhodesians."

"Clearly, he was not anyone's opinion but his own sort of thing happened."

David Owen, Under-Secretary of State for Commonwealth Relations, announced this appointment at the start of an open week at the House of Commons last Sunday.

Mr Owen, who will be the only education minister in the group, has been principal of the centre since 1969. He has been in the group since 1969. He has been in the group since 1969.

One of the executive committee members who supports the centre is a former student who has been in the group since 1969. He has been in the group since 1969.

The centre has 115 inhabitants in modern buildings scattered in grounds in wooded Berkhamstead near the village of Crowthorne.

'Safe place' for the handicapped

by Diane Spencer

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Dr Owen, in his speech at the open week, said he approved the idea of village communities, like Ravenswood, for the mentally handicapped. They need some degree of shelter and care and could feel lonely and isolated with no sense of identity if they were put out into the community on their own.

But the village community was only one of many ways of looking after the mentally handicapped. He emphasised that during this time of financial stringency, a change of attitude by the professionals caring for the handicapped and by the public was equally important.

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Report on reading goes unread, UKRA told

by Jane Fienmann

The Bullock report is in danger of passing into obscurity because few people are taking the trouble to read it. Dr Joyce Morris, a reading consultant, told a conference organized by the United Kingdom Reading Association last week.

Dr Morris, who gave evidence to the Bullock Committee, said she was amazed by the number of people who confessed to almost total ignorance of the report's contents. Every British teacher should read the whole of it and not depend on press coverage.

It was significant that chapter one should be about different attitudes to teaching English. "Naturally these exist. Some teachers regard the subject as an instrument of personal growth, or perhaps even of political change, while others see it as a simple training in grammar. Although this may create difficulties when there are clashes of personalities in the same school it is healthy enough, except where the teacher's attitude to reading prevents the children from learning to read."

Several teachers had said recently that reading was too bourgeois to be bothered about. "Teachers who feel this way should not be in education," staff should meet regularly to discuss differences in attitudes, particularly where it was felt that reading standards were being affected.

Bullock had emphasized the "manifold advantages" of school bookshops, financed by publishers and actually on school premises, but these were virtually banned in some areas because, for example, education officers and teachers, detected a "taint of commercialism."

"The idea of having attractive

books readily available to children seems to be frowned upon because the people who produce the books are in business, and, therefore, money-grubbing monsters."

A call for in-service training to take place in the schoolroom and be organized by working teachers was made by Professor J. Merritt, professor of educational studies at the Open University and member of the Bullock Committee.

He said that his job of organizing refresher courses for teachers, was a waste of time. When teachers returned to their school, they returned to a hostile environment where all changes were seen as an attack on the teacher's colleagues.

The number of those who actually became more knowledgeable through these courses was so small that the operation had just a cosmetic function. "The most valuable and interesting lecture given by the most fascinating lecturer is useless unless it is followed immediately by direct application in the classroom," he said.

Professor Merritt said that teachers should decide together on what priorities they wanted and how they would achieve them. The mass of inspiration in the teaching profession had to be harnessed: "It is not enough to be inspired, you must also be professional," he said.

Teachers should establish the concept of an official evaluation and development cycle for every teacher. "It is no good bringing in experts to tell you what is needed, because you as the teacher have the vital experience—and therefore the responsibility for reform," he said.

There must be regular staff meetings to monitor the list of priorities and when a teacher did attend a course his experience should be passed on to the other teachers. Local authorities and head teachers failed to do this at the moment, he said.

a teacher's own subject

Readiness

There is no way a subject like CoRT thinking could ever be imposed on a teacher, school or education system from above. The success of the process has depended entirely on the matter-of-fact readiness of teachers to treat thinking as a skill that can be developed by direct attention and practice. The CoRT material has only served to crystallize this readiness into something to do and something to do next. If CoRT thinking becomes a regular part of education it will only be because teachers themselves want it—and have made the material work.

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4. Evidence: structure
5. Agreement, Disagreement, Irrelevance
6. Being right I
7. Being right II
8. Being wrong I
9. Being wrong II
10. Outcome

CoRT IV

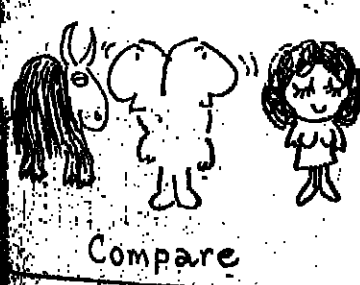
1. Yes, No and Po
2. Stepping stone
3. Random input
4. Concept challenge
5. Dominant idea
6. Define the problem
7. Remove faults
8. Combination
9. Requirements
10. Evaluation

CoRT V

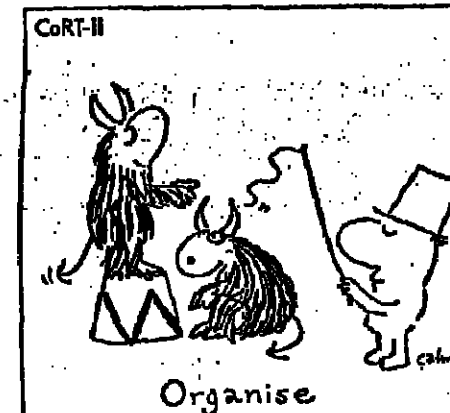
1. Information
2. Questions
3. Clues
4. Contradiction
5. Guessing
6. Belief
7. Ready-made
8. Emotions and ego
9. Values
10. Simplification and clarification

CoRT II

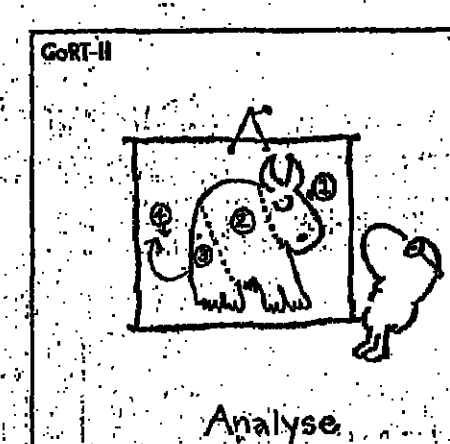
1. Information
2. Questions
3. Clues
4. Contradiction
5. Guessing
6. Belief
7. Ready-made
8. Emotions and ego
9. Values
10. Simplification and clarification



The CoRT lessons are part of link with the outside world. For all you don't go writing essays you leave it to you? (a pupil)



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Further particulars and application forms may be obtained from the Secretary (Ref. T), Cambridge Institute of Education, Shaftesbury Road, Cambridge, CB2 2B, to whom applications should be sent as soon as possible.

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DES sound alarm
over dinner queues

by Gavin Scott

The Department of Education and Science is investigating local authorities all over the country to find out if they have children on long waiting lists for school dinners.

This was revealed by a DES spokesman this week after Leicester education department admitted they were unable to provide school dinners for all the children who want them.

Leicester's admission came in response to a report from the local Child Poverty Action Group which said many children had to wait 18 months and more to be able to take school dinners because of lack of space and shortages of supervisors. Children whose parents are on supplementary benefit, and who get their meals free, are among those affected.

The education department have now contacted every primary head in the city and found there are 800 children on waiting lists. But they say there are only 39 free school meal children among them, all at one school, Midway Juniors, where there are special problems because of a large number of mobile classroom children. However, some children on the free list have been given dinner places since the CPAG report on Monday.

Miss Joan Lester, the under-secretary at the DES, was visiting city schools on Monday when the report was released. She spoke with local officials and later said that the problem of waiting lists for meals probably existed in every major city in the country.

The DES subsequently explained that Miss Lester was referring to short-term waiting lists caused, for example, by an influx of immigrants. She commented on the denial of free meals to children entitled to them.

The DES school meals adviser is to talk to Leicester officials to find out the extent of the problem. If the claims are confirmed, other authorities will also be questioned. It is the legal duty of every authority to provide school dinners for those who want them.

The CPAG report focused on Knighton Fields primary school, where there were over 50 children out of 285 without meals, and where the headmistress has forbidden children to bring packed lunches because there is no one to supervise them or clean up afterwards.

One mother, Mrs Jean Leeson, who is divorced and on social security, has had to collect her three children from the school every lunchtime for four years, and this has, she says, prevented her from taking a job.

Another mother who cannot afford to leave her work has to leave out tins of baked beans and soup for her children to heat, after they have come home across two major roads. Last year, says the CPAG report, a child was run over on the main road outside the school on the way home for lunch.

The headmistress of Knighton Fields Junior School, Mrs Vivienne Gustafsson, says there is not enough time to hold a second lunch sitting in her hall because it is in constant use. She says it would be impossible to use a classroom because they are also in constant use, and because there is no one to supervise the children.

"I am only entitled to one supervisor for 75 children," she said. "If I let the other 50 have a meal, I would not be allowed another supervisor."

"As it is I spend all my lunch-times helping the supervisor we have got. As for packed lunches, it is policy all over the city to forbid them in primary schools, and they would require a supervisor, a classroom, and cleaning up afterwards."

All children entitled to free school meals have now been given them, she said, but generally it was a matter of waiting for the new school year. If a child's father lost his job now, and the child became eligible for a free meal, it would be a matter of waiting till next year or until someone moved out of the area, she said.

Some of the mothers have come to me and offered to supervise the children during the dinner hour, if that is the problem. But, of course, that would be impossible. We could not have people helping here who were not officially appointed by the department," Mrs Gustafsson said.

Mr Tony Davis, deputy director of education, said Leicester provided 66 per cent of its children with school dinners, but could not cope with any more.

"Our kitchens are producing 1,000 meals a day more than they are supposed to," he said, "and 4,000 more than last year."

"But accommodation and supervision are the main problems. We would have to spend more money on supervisors if we were to feed more children. We are looking at having two sittings, but it is very hard in primary schools."

"As far as the ban on sandwiches is concerned, we are going to take the matter up with head teachers. But it is a matter of pressure on scarce resources."

Up the protest
content,
say doctors
THE boat rocked by
opportunity waves

School dinners are still being vulnerable to government decisions affecting higher education. Instead they should provide a team of whatsoevers for the university.

In an industry into the of schoolchildren in teams at the food intake of the British Educational Administration Society in Cardiff that judge their results, published in the latest edition of the journal of higher education simply in accordance with the facts.

Professor Maurice Kogan, professor of social sciences and administration at Brunel University, said some teachers worked far better for better causes, and before the recent large rise in the cost of protein food like meat.

The Ministry of Education in 1955 recommended school dinners should account the deficiencies of home diet was still relevant. "Any reduction of protein content of school meals would be undesirable."

Children from disadvantaged groups derived more of their weekly intake of essential nutrients from school meals than from other children. The rest of the week, with more sweet foods and fewer of the nutrients.

It was difficult for the school meals to compare the standards for school meals with what actually eaten because different amounts and different foods were eaten. But, generally, the school meals met the standards, Mrs Gustafsson said.

The average energy content of the meals was slightly above the standard was about a third too low in the meals.

Cheaper sources of protein he used to hold down the providing meals up to the more milk, cheese, vegetable, and less meat, eggs.

Children who had served were better fed at lunch than those who did not but there was evidence that children at school meals were heavier or fatter than those not.

British Journal of Preventive Social Medicine, September vol 29, no 3.



Professor Kogan.

Higher education has been seen to ride itself of apartheid, moves through a decade of uncertainty on to a genuine comprehensive system in which pluralism, which means everybody gets what they need, predominates.

He did not think governing bodies should interfere in detail or even substantially with the curriculum. Professor Kogan argued that there was no educational institution funded from public monies which was autonomous. "In the literal sense of the word, it seems likely that the only autonomous institutions are private schools and the University College, Buckingham. But this turns, perhaps, on the pedantic question of whether there are degrees of autonomy."

The generalization to be made is that there is no educational institution resolving public monies which does not respond to one form or the other of prescription from some superior or otherwise controlling body."

BEAS conference

Reports by
Mark VaughanPupils have
parents...

Miss Anita Ellis, deputy head of Hartcliffe comprehensive school, Bristol, told the conference that teachers were undeniably accountable to parents, but too many teachers failed to accept this.

Schools, especially state ones, often paid only lip service to the fact that their pupils actually had parents, and that formal education up to mid-adolescence was a three-cornered affair involving pupil, school and parents.

Parents entrusted their children to teachers. "We must make clear our aims, our values and our priorities, inform parents of the thinking behind changes of curriculum and organization and expect to be challenged by them as we work. We are, after all, working with their children. Parents often do not receive the respect due to them by schools. And schools are often trapped by knowing that the necessary innovations are difficult for parents to appreciate."

However, Miss Ellis said schools were caught in a painful dilemma: they were torn between the teacher-parent contract and the contract between teacher and society. A teacher exercising professional skills and judgment could also be in direct conflict with the wishes of the parent. The final line which divided responsibility to the pupil and the parents' rightful position was particularly hard to hold when the teacher felt the parent was wrong.

'Make staffs do their
own budgeting'

Corporate management has a lot to offer education officers and their committees and this will be even more true during the difficult economic period ahead, Mr J. K. Boynton, chief executive of Cheshire, told the conference.

There was a danger of educationists being unwilling to experiment with techniques which were commonplace elsewhere. It was not enough simply to say that the corporate management benefits to education could not be measured.

He disagreed with arguments that as education became wider, dealing in subjects which were not "parrot fashion learning", it was pointless to try and set objectives or measure results. "There is a great deal of (corporate management) expertise available in local authorities which could be harnessed to the advantage of the education service."

The most helpful line of approach was to make the larger schools "more clearly responsible" for the money and resources they were given. Head teachers should be encouraged in consultation with staff, to set practical objectives of achievement. "Ensuring the best use of resources is likely to be a major issue in the next few years."

"I suspect that we could do a great deal more to base our allocation of resources upon individual schools, and to increase the accountability of headmasters and their staffs for the use of resources entrusted to them."

Education should remain in local government. "This is not a question of self-interest. In this country we have rightly regarded with suspicion any attempts at over-centralization."

In the present crisis the education service could not stand apart from other local authority services in trying to survive a target of zero growth. It was not sacrosanct and did not have "some divine right" to escape the scrutiny given to other services.

Mr Barnes, a former president of the Headmasters' Association, said it was inherent in the philosophy of corporate management that administrative authority should lie with the chief executive in cabinet like the Tudor kings in Parliament. In enlightened authorities, there will no doubt be delegation, but of a functional kind only."

A letter from his own CEO this week said that the authority's personnel committee had decided that from last week no vacancies could be filled without first going through an elaborate procedure designed to establish the absolute necessity of an appointment. The chairman of the personnel committee would have the final word. "So far from being consulted, the teachers were not even informed of the decision until it was in operation."

"I do not know whether this is corporate management. It certainly looks like corporate pusillanimity."

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Successful applicants may be eligible for secondment.

Further information is available from:

The Secretary, D.C.S., School of Art Education, 26 Priory Road, Birmingham B5 7UD.
Telephone 021-440 2836.

Inquiries and applications should be addressed to:

Admissions Section (AE)
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The course leads to a Certificate, and a further certificate is envisaged at the end of a subsequent year's work in the field.

The course will start in January, 1976. The course is suitable for secondment, and immediate application should be made.

Applications and requests for further information should be made to the Head of Department, Arts and Language Studies, at the address above.

Applicants will be required to attend an interview before being accepted for the course.

ilea

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4. M.Ed., B.Ed. or Diploma in Social and Community Education.
5. B.Ed. or Diploma in Special Education.

Teachers serving in L.E.A. schools are eligible for secondment on full salary. Certain other applicants may be eligible for grants from their Local Education Authority.

Further details and application forms are obtainable from the Secretary, Department of Education, University College of Swansea, Healdston, Swansea SA2 7NB. Applicants should state clearly the course in which they are interested.

SRC urge outsize grants for 'special' postgraduates

A fundamental change in the principle of university student grants was how Professor Sir Samuel Edwards, chairman of the Science Research Council, described the council's proposals last week to give larger grants to postgraduate students in subjects which were considered to be of national economic importance.

The SRC's proposal, which was announced in one of two Research Council reports on postgraduate training, is that able students should be attracted to such things as engineering research by improving their grants.

The report, *Postgraduate Training*, says that in Germany engineering students can get grants up to £10,000 a year, while in the United States they can get up to £15,000. The number of graduates who go on to further training after some work experience will never be increased unless grants are improved for them. Dynamic increases in the cost of living recently made it impossible for some postgraduates to continue their studies. This "must be deplored".

The report, produced by a working party chaired by Professor Edwards, recommended that in order to help the matching of postgraduate training to the national needs the SRC should seek a substantial increase in the value of student grants in special areas and on courses of training selected for their economic importance.

Though Lord Croomer-Hunt, the Minister for Higher Education, has now publicly dropped his earlier suggestion that universities should direct students into courses best suited to the country's economic needs, the SRC's proposal is a close relative to one contained in a Commons Select Committee report on science and technology last month. The committee's proposal was that science postgraduates in general should get higher grants than those in social science or humanities.

Professor Edwards said the council would have to have Government approval for this radical change in the principle of student maintenance grants. It was justified, "It is crazy to have whole departments like the Department of Control Engineering at the University of Manchester Institute of Science and Technology with nothing but Persian students. It is crazy to spend all this money on technical education and then not use it."

A spokesman for the National Union of Students said they would oppose, as they had in the past, any proposal for differential grants.

Victims of myth and theory

Nurture groups break through the cycle of inadequacy, defeat and despair among the severely handicapped, said Mrs Marjorie Boxall, an education psychologist with the ILBA, at Lancaster on Saturday.

She told a conference, "Disadvantage '75", which was organized by the College of Preceptors and the Association for Child Psychology and Psychiatry. The personal development of children with emotional problems and indifferent homes often left them ill-equipped for ordinary schools.

In a nurture group, however, the teacher assumed the role of mother, comforted the children and controlled their impulsive behaviour and their energy as though they were normal.

Gradually they were taught attention through concentration and helped to develop mentally relevant activities and experiences. The teacher encouraged subtle, delayed and socially approved satisfaction instead of primitive and immediate pleasure.

In contrast with the pathological approach of the child guidance clinic, the nurture group provided conditions for healthy growth through the "ego-building, impulse-controlling, world-mediating commitment of the teacher".

Teachers and social workers in the audience were concerned that the systems of research had been conducted into the effects of this "developmental technique, which is based on empirical findings and the intuitive response of the teacher. Mr Philip Robson, vice-principal

"This is another way of tying education to the needs of big business. We think education should be based on the needs of students."

Students needed the same whatever they were studying. The logical extension of the proposal was that arts students should get nothing.

The universities themselves are split on the issue, with the Committee of Vice-Chancellors and Principals still to decide their attitude.

In evidence to the Commons Select Committee for the Vice-Chancellors, Sir Brian Flowers, principal of Imperial College, London, expressed a personal view against differential awards. Students would find it "offensive", he said, and the existing machinery was adequate for controlling the numbers in different fields.

Sir Samuel Curran, vice-chancellor of Strathclyde Technological University, took the opposite view. Differential awards, he said, would be an indication of the value the country put on particular activities.

"I have thought about it deeply since giving evidence," said Sir Samuel this week, "and I have come to the conclusion that I am also inclined to say differential awards to undergraduates in all technologies, including engineering."

International comparisons, he said, show that many of the most talented in Britain go into arts, sociology and pure science, whereas the status and prestige attaching to a career in technology is very much greater in the United States, Germany and Japan.

"I think we must take urgent measures to change this. I am not very hopeful that we shall get differential grants for undergraduates at this time, but one day we must try and attract bright young people to this country into technology and engineering."

Lord Bowden, principal of UMIST, is in no doubt that the country needs postgraduate trained technologists and that they would have to be paid more to attract them away from jobs where they could earn much more.

Departments of engineering, he said this week, were collapsing and though some universities did more harm than good with postgraduates, the whole education system was predicated on the idea that leaving on the job "sitting next to Nelly", he called it—was not the best thing.

"I am for paying engineers properly. I don't mind what happens to the rest."

There is little doubt that empty places in high courses in applied science SRC have recently found applicants for all the postgraduate students they need. But this is not the same thing as meeting the trained manpower needs of industry.

Industry, if, as the year, industry needs have been trained to such a level that it is now possible to fix the past events, geological but paleontological, by measurement of the magnetism of ancient rocks. The SRC would need such training and intervals in the course of geology and now there is an accurate and reliable calendar when these reversals occur.

When these reversals occur, the working party on the issue is not whether education should be based on the needs of industry or not. The SRC would need such training and intervals in the course of geology and now there is an accurate and reliable calendar when these reversals occur.

A substantial improvement in postgraduate education qualification were recommended on direct teaching research alone.

A new form of science having a status to the traditional field time.

A second report on training was published by the joint SRC/Social Research Council committee on interdisciplinary research.

The joint committee recommended a threefold increase over five years in these departments. In 1980 there are 10,000 students in these departments, divided equally between science and social science. This would cost £1m a year. Students following such a course would have gone on to jobs in management, administration, and commerce, they would have been the earth's magnetism is true or spurious.

It looks as if claims that these must be taken with a pinch of salt. Dr Kenneth Vortub, University of California at Berkeley, has shown on the basis of measurements of some extremely thin layers of mud laid down in the late Pleistocene in Massachusetts that the layers are known as "varves" and that they are even the most regular of sediment can conceal all sorts of disturbances, so that it may be impossible to tell from a single varve whether its record of what has happened in the earth's magnetism is true or spurious.

Of course, is no great surprise that it is a disappointment, but because methods of telling the date of geological events are so difficult, and 250,000 years means of radiocarbon are poorly developed.

It is a chance that British high-energy physics in the years ahead will be the highest by the decision of the German Government, which last week announced that it was to build a new machine for making high-energy collisions with protons and positrons collide with each other. The machine is called the "Large Hadron Collider" and is, in principle, similar to the "Large Electron-Positron Collider" built in the past three years at CERN.

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Too quickly into print

My scepticism about the reported discovery of a magnetic monopole (September 5) appears to have been shared by others. The issue, it will be recalled, is whether the track left by a particle in a stack of particle detectors flown on a balloon flight, was caused by a heavy atomic nucleus or by some much more exotic entity.

Altogether, there were three detectors—a layer of photographic emulsion, a device called a cerenkov detector which, for practical purposes, can estimate the speed of a particle travelling at a substantial fraction of the velocity of light, and a thick sandwich of sheets made from the plastic Lexan.

There is no doubt that the measurements made by Professor P. B. Price, of the University of California, at Berkeley, and his colleagues of the responses of the three kinds of detectors were inconsistent. The question was whether the inconsistencies could be explained by statistical variations in the responses of the three detectors, or whether they called for the existence of something radically novel. Price and Co plumped for the second alternative.

Now there is a formidable array of people saying that they backed the wrong horse. Professor Peter Fowler, from the University of Bristol, told a cosmic ray conference in Munich last month that he thought the observations consistent

with the passage of a large atomic nucleus through the stack of detectors—something like a platinum nucleus.

Professor Luiz Alvarez, of the University of California, broadened the issue at a recent meeting at Stanford University, where he raised the question: when is it permissible, on the strength of a single set of observations, to announce the discovery of a new kind of atomic particle? It is the old problem that one swallow does not make a summer.

Over the years, and after many disappointments such as that about the discovery of the magnetic monopole, physicists have become exceedingly cautious. For the past few years, for example, a group of Indian and Japanese scientists have restated themselves from making a public song and dance about a handful of puzzling interactions observed in equipment installed in a deep mine shaft, and which may in due course turn out to be proof of a novel interaction between neutrinos and nuclear matter.

In the circumstances, it is inexcusable that Price and his colleagues rushed into print as quickly as they did (and why the respected journal, *Physical Review Letters*, allowed them to do so.) It seems yet further proof of the distressing eagerness to get into print for what the profession already has a bad name.

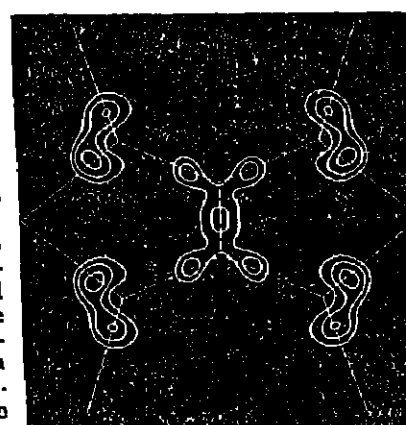
Shapes like a butterfly

Chemistry is full of curiosities, and one of the most remarkable for a long time is a report (*Science*, October 10) by a group of chemists at the California Institute of Technology of the existence of a kind of water super-molecule or, more accurately, a super-ion, which consists of six water molecules and a hydrogen ion all tightly bound together in a single flat structure shaped a little like a butterfly.

The story is this. The group was making a crystallographic investigation of a complicated organic compound whose molecules form cages which have the capacity to encapsulate chloride ions much as mice are caught in a trap.

In one series of experiments, they crystallized their cage molecules from hydrochloric acid, and found that the crystals they obtained consisted of mixtures of the cage molecules and of discrete structures each built from six water molecules and a hydrogen ion.

In other words, they have discovered ions with the formula H_7O_6 each of which carries a single positive charge. In a funny way, this discovery is a record. Seven years ago, it turned out that

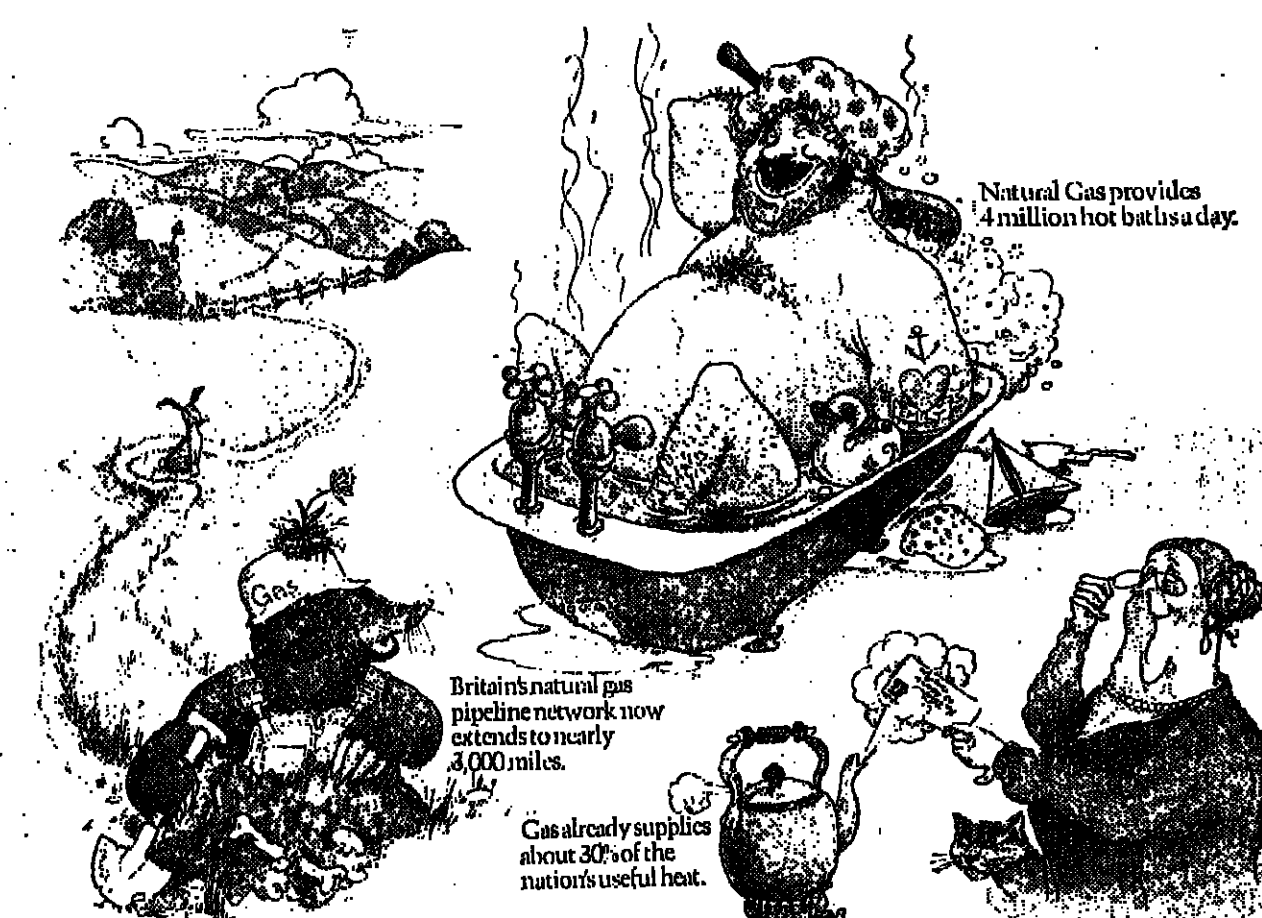


Arrangement of six water molecules in the ion H_7O_6 identified at the California Institute of Technology. The centre of the diagram, which shows contours of electron density, is occupied by the spare hydrogen ion.

In certain types of crystals the complex of four water molecules and a hydrogen ion seems to form a stable unit in many kinds of crystals but nothing more complicated has since been found.

The interest of these strange molecules is no doubt largely academic. Nobody suggests that they could exist on their own, while in ordinary water they are only likely to be statistical rarities among the many complicated kinds of structures involving water molecules.

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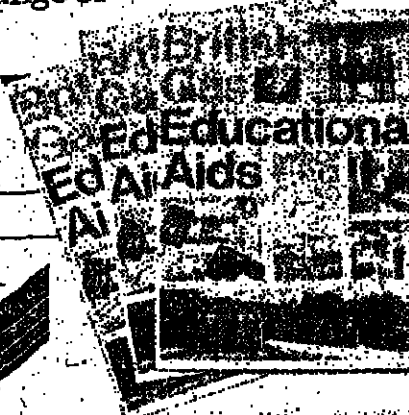
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United States

Agreement threat may close classes again

from Thomas Cahill

NEW YORK The settlement of the New York City teachers' strike (TES September 26), though it got teachers back to work, has raised a series of new problems that threaten the future of the agreement.

The great difficulty that faced the negotiators of the New York City Board of Education and the teachers' union was how to protect gains won by teachers in previous contracts without increasing the size of the new budget—despite inflation and despite the fact that the city's economic crisis has already forced the dismissal of 4,500 teachers.

The teachers' union, though ready to abandon demands for significant salary increases, was unwilling to allow an increase in the size of classes—32 students per class in elementary schools and 34 in high schools—and would only partially meet the board on the issue of free preparation periods.

So the board negotiators proposed that the school day be reduced for students by two 45-minute periods a week, and that the teachers use the time "saved" as preparation periods.

The reduction of the school day has caused considerable criticism by parents and local school boards who consider it a betrayal of the children.

Mr Ewald Nyquist, New York State's Education Commissioner, claiming that the loss of the two periods puts the average daily class time below the state-recommended minimum, has said that he will seek new state regulations estab-



Protesting teachers last month.

lishing minimum school days.

And Mr Hugh Carey, governor of New York, has just challenged the settlement, saying that his cost analysts indicate that the new pact could cost the city \$140m—as much as \$80m, more than has been budgeted.

Mr Carey's statements represent a new trend of active involvement by state officials in the financing of public education. His involvement is also another indication that he and his advisory boards—and not city officials—now control the budget of New York City.

Senate moves against bussing

In further attempts to curb the use of bussing, both the House of Representatives and the Senate have attached amendments to vital Appropriations Bills funding Government agencies.

The House measure, which is unlikely to succeed, a House-Senate conference is scheduled to discuss the bill and forbids the use of gasoline in buses used in court-ordered bussing for desegregation.

In contrast, the Senate's two measures, which are attached to the \$45.2 billion appropriation for the Department of Labour and the Department of Health, Education and Welfare, are carefully designed and have involved both sponsorship by and support from traditionally liberal senators.

One of the Senate amendments would prevent use of funds appropriated in the Bill to "require, directly or indirectly, bussing of children beyond the school nearest their

homes in order to comply with the Civil Rights Act.

Also attached to the Bill is an amendment which forbids HEW to threaten withholding of school aid funds as a method of forcing school districts to bus students for reasons of race.

The Senate amendments would leave court-ordered bussing unaffected, and most bussing programmes originate with the courts rather than with HEW. Since court decisions are based on constitutional arguments, regular legislation is unable to prevent them.

Boston goes back

Boston's teachers have ended their strike (TES October 3), gaining a 6 per cent salary increase. Additional health benefits, more free periods and some assurances of job security in a system whose white enrolment is rapidly dwindling because of court-ordered integration.

Soviet Union

Record number of places, but problems persist

by Kenneth Shaw

In the last four years 5,600,000 school places, including 4,200,000 in rural areas, have been provided through new building programmes. More than 500,000 new teachers have been trained and a total of 14m students are enrolled in the country. In 1974-75 more than 14m roubles were spent on rural schools, and this year middle education will be provided for about 96 per cent of the total population.

Economic planners and Party officials, however, are not satisfied with what they call the "average" quality of the knowledge of Soviet students. Blame is partly attached to the failure of schools and educational research institutes to put new findings into use inside schools.

Research into education is a growing part of academic studies. It is carried on not only by full-time staff in research establishments but also by working teachers and part-timers. The number of part-time scientific correspondents of the Research Institute of the Academy of Sciences, for example, exceeds 2,000. The topics designated by the Institute alone are

being worked on by 900 educational bodies throughout the Soviet Union. Too frequently, however, the results of expensive research are being shelved. Meanwhile, many problems remain unsolved. According to the *Pravda*, the professional competence of teachers cannot hide behind its recent successes in building and provision of places. The management of school staffs and systems of checking the ways in which education is being conducted in Soviet republics is being especially criticised. There are also many deficiencies in the professional training of future teachers, and researchers are not paying enough attention to scientific work management and the economic use of resources.

An important aspect of academic activity is the dissemination of information "both inside and outside the country" says the journal. To applaud the increasing cooperation between Russia and other socialist countries and suggests that Russia can learn much from collaborative research. One such area is that of polytechnical education and the use of the multi-disciplinary approach.

Kenya

Government launches 'relevancy' probe

by John Borrell

The Kenyan Government has appointed a commission to study ways of making the education system more relevant to the needs of the country.

The review, which is to start this month, is being taken on the advice of a Bank report which warned of the present rate of increase. 80 per cent of Kenya's budget is spent on education by the end of the decade.

The report said: "A more disciplined control of secondary education in Kenya is needed to meet the needs of the labour market. It is the most obvious source of savings in the expenditure."

The establishment of the mission on Education Objectives announced by Dr Zachary M. Njoroge, Minister of Education, will be to evaluate the various parties with a view to formulating a programme of reform.

Kenya's education system modelled on British colonial days and there has been a proliferation in recent years of a system has been turning out people with the wrong kind of education.

Further, although the Government provides free primary education for more than three million children, 14 per cent of these are primary school.

And as the primary school system concentrates on giving pupils training in academic subjects like reading, writing and maths, the school are left with few new skills.

One of the main tasks of the mission will therefore be to examine the possibility of introducing vocational subjects at school level so that the vast number of early leavers will have employment prospects.

For a secondary school commission is likely to place greater emphasis on practically oriented subjects.

At university level, science, engineering, and agricultural courses, rather than subjects.

Norway

Sex equality jobs boost

from Mike Duckett

Women applying for jobs and headhunting companies are likely to be asked to demand written statements of their educational qualifications were successful applicants.

The right to work over in favour of several proposals for equality between men and women working in the employer equal opportunities training, further to leave of absence for books, should reflect the elimination of sex-role stereotypes.

Although the Bill also provides the possibility of proving the position in the future, no difference in either formally placed or allowed unreasonable dismissals and temporary dismissals.

The right to a written statement of the qualifications of successful applicants is a major improvement. It is hoped that the Bill will encourage more women to enter the educational grounds, such as teaching, appointments, vision will apply to all public and private sectors.

West Germany

Vocational training Bill still deadlocked

David Dungworth

The Government's controversial plan for the reform of vocational training, first published nearly two years ago, have been given a three-year hearing before a specialist committee of the Bundestag.

Among those who attended were university and economics experts from the universities, members of the government coalition and Opposition parties in Parliament, and representatives of the *Länder* education authorities, chambers of commerce, crafts and industry, employers' organisations, and teachers' associations and the *Deutscher Gewerkschaftsbund* (West German's TUC).

Although the hearing was held in a friendly atmosphere, the proposed reforms, it was pointed out, were not a simple matter of various parties with yet another source of savings in the expenditure.

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Italy

Unemployment among young rises 70 pc

from Dalbert Hallenstein

ROME The Ministry of Labour estimates that in July there were 370,000 young people registered as unemployed, a 70 per cent increase on the same time last year. But the ministry admits that these figures are limited to those under 21 and that in any case only a fraction of young people in search of work actually register.

The Central Government Statistics Office (ISTAT) estimated in its latest survey last April that 416,000 young people were then looking for their first job, 108,000 more than in April 1973. But an ISTAT official openly agreed that the real figure must be at least 800,000.

The ISTAT estimate was made a month before almost 300,000 school leavers and at least 65,000 new university graduates were about to enter the labour market at the end of the 1974-75 academic year. Leading educationists and sociologists are therefore estimating that by now there are just under a million unemployed young people between the ages of 14 and 29 in search of their first job.

The confederated industrial unions appear remarkably uninterested in the problem. The central research institute of CGIL, the largest of the confederated unions, admits that no study of the problem is at present being undertaken and that they have no precise information.

This indifference is only one of the factors exacerbating the plight of the young. With increasing general unemployment, and with thousands of businesses and factories closing down or working short time, firms are no longer taking on new personnel. A recent survey has estimated that 70 per cent of Italy's total unemployed are between the ages of 14 and 29.



Herr Rohde: little progress.

a levy of 0.25 per cent of their gross wage and salary bill whenever the total number of training places available exceeds the demand for them by less than 12.5 per cent. The fund thus set up would be used to pay subsidies to those firms who are prepared to employ more apprentices.

This provision, according to the employers' associations, will cost industry about DM2,350m (£430m) a year. For firms with up to 20 employees it will mean additional staffing costs of at least 10 per cent.

Union representatives, however, denied that the Bill, if passed, would be calculated to accurately in advance and insisted that any higher costs would be justified by improved standards of training.

An indication of how little progress had been achieved was given in the statements made by Government and Opposition spokesmen after Herr Helmut Rohde, Minister for Education and Science, claimed that the reforms were essential to guarantee the future provision of vocational education. Herr Bernhard Vogel, CDU Education Minister of Rheinland Pfalz, on the other hand, announced the Opposition's intention of putting forward an alternative package.

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France

Unions stay sceptical of moves to aid school-leavers

from William Farr

PARIS The Confederation Generale du Travail (CGT), the country's largest federation of trade unions, estimates that 400,000 of this year's 600,000 school-leavers will not find jobs for many months and that by the autumn there are likely to be 900,000 young people under 25 out of work. Summer figures from the Ministry of Labour already showed 300,000 jobless young people under 25.

To combat the situation the Government in June made more money available for grants for those willing to take two to three-year courses in technical secondary education colleges (CETs). It also offered an extra term to those who were expected to fail the examinations at the end of the first year so as to enable them to catch up and carry on.

Further, under the so-called Operation Fifty Thousand, 20,000 young people under 20 registered as out of work—who left school without any professional or technical qualifications—are already following six-month training courses during which they receive £30 a month and travel and housing expenses. It is expected that a further 30,000 will take up courses during the coming months.

M. Paul Granet, Secretary of State for Professional Training, has said that there will be jobs available for young people who acquire the basic qualifications provided by these courses. Within the retraining programme M. Granet is receiving an additional £40m for financing pre-professional training courses and employment-training contracts, and for equipping professional training centres.

The employment contracts are designed to help young people without qualifications to start working. Employers who undertake to give them a job and provide 150 to 500 hours of training during the first six months of employment receive subsidies from the State.

In addition to these measures the Government is paying a premium to employers who set up new jobs for which young people can be recruited. The initial contracts must be for at least one year. Employers who did this between June 30 and October 1 received £55 a month for six months for each post created, and since October 1 they are receiving £35.

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South Africa

Incentive for unskilled Blacks

from William Farr

SOUTH AFRICA'S plans for training young Africans in the "White" industrial areas to perform skilled work hitherto reserved for Whites have got off the ground.

Details of the training programme were worked out by an inter-departmental committee under the aegis of the Department of Basic Education; among the first fruits is the construction of two training centres which have been opened in Soweto, the African city with a population of more than three-quarters of a million on the outskirts of Johannesburg.

Six more centres are to be opened next January and two more at the beginning of 1977. Most of the centres will be in the Witwatersrand industrial complex and the rest in the Pretoria, Durban and Port Elizabeth areas.

It is expected that a further 30,000 will take up courses during the coming months.

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Sixth-formers set against physics

Sir—My work at Lancaster University department of educational research in the past year has led me to a different interpretation from Brian Woolnough in his letter about the non-existent swing away from physics (September 26).

While I acknowledge the apparent increase in popularity of physics at O level in the number of entries and passes (which was after all, one of the conclusions of the Dalton report in 1968), I suggested that a real intrinsic swing against physics has taken place at sixth-form choice stage and that pupil dissatisfaction with O level physics could be a contributory factor.

Although Brian Woolnough quotes both O level and A level figures, he does not make a firm comparison between them. If, however, the number of O level subject passes is compared with the number of A level entrants in that subject two years later, one gets the swings shown in the accompanying table. And clearly among the eight major A level subjects, the swing against physics is the greatest.

This method of analysis, using published DES data, has an advantage over other methods—such as those of Derek Duckworth (C Swing against "hard" subjects)—T.E.S., November 15, 1974) and the Dalton report—because it is independent of the changing composition of the sixth form referred to by Woolnough, Duckworth and others. An analysis of data by sex is also possible—and the pronounced swing against A level biology by boys is particularly intriguing.

I hope to report more fully in the near future on a survey which attempted to identify factors in physics education that are relevant to the swing away from A level physics. But I feel this preliminary note is needed to balance Brian Woolnough's letter and to promote further discussion.

A. W. PELL, The Barons Close, Lillingham, Northampton.

Subject	1973	1974	% change in number of A level entrants two years later
Biology	422	441	+ 4.5
Chemistry	746	746	0
Physics	422	441	+ 4.5
French	244	263	+ 7.8
Geography	237	256	+ 8.0
History	424	433	+ 2.1
Mathematics	354	374	+ 5.7
Music	92	101	+ 9.8

The percentage for biology includes ancient history, for biology includes biology and physics, and for A level mathematics includes pure mathematics and the single subject pure and applied mathematics.

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Wanted—a few militant parents

Sir—Your article, "Liverpool row over parent governors" (September 26), while drawing attention to the concern felt by some of us who are involved in education in Liverpool, fails to highlight the peculiarities in the nominating process.

The letter, which Mrs Jennings so rightly says was written in officiousness, and which was sent to schools on the first day of term was not sent out by all schools as early as it might have been. In at least one school the children were given it to take home on Monday; nominations closed on Friday at noon. This gave working parents 31 days in which to collect a form (40p return bus fare), fill it in, and return it (40p return fare again).

Naturally, the office in Sir Thomas Street closes before most people finish work, and it is not easy for factory workers to get to the city centre in their lunch breaks. Teachers already have contact with the office via the regular mail deliveries, and collections, twice weekly. Would it really have been so difficult to have included nomination forms in these deliveries and collections? I think not.

Irregularities of this kind could have been avoided by teachers giving out the forms and collecting them again. I would have objected to doing this, but I was not consulted. One of my "leaders"

seems to have decided for me what I should think on this issue.

I am desperately concerned as parent and teacher to get parents involved in running their local schools. Standards in comprehensive schools, which are "socially deprived" areas will not improve unless and until the parents can see for themselves what is going on. One or two brave heads in Liverpool are showing the way; the rest seem to be afraid if parents get into the schools in any capacity, their own power will diminish.

Considering they are mostly earning £8,000-plus, it is about time they accounted for their stewardship—or lack of it—and refrained from hindering attempts to introduce democracy into school government. Their salaries—and mine—are paid largely by parents, and we have a duty to answer to them for our failures, and to allow them to see for themselves the appalling buildings in which their children are being taught daily.

I allowed children to keep their coats on in class on Friday; the temperature in the staffroom was 56°F. We could do with a few militant parents to help us out in these circumstances.

EDITH BUSBY, Chairman, Liverpool Liberal Party.

Dyslexia is no myth

Sir—The syndrome described accurately in Tom Crabtree's article (September 25) is no myth. There is nothing vague about dyslexia, even though its symptoms cannot be measured. Ask any parent of a dyslexic child.

For the moment, let's begin by forgetting the word "dyslexia" and consider the condition itself. To teachers, its neurology is irrelevant. They are concerned with remediation. In this school for children with severe language disorders, all are poor readers, but for obvious reasons. However, despite high quality remedial teaching, there is a cut-off point below which, even by our standards, extraordinary methods have to be adopted.

A good deal of the discrepancy between the incidence of the condition here and in France and Germany could be attributed to the relative phonic regularity of their languages.

In the past, the phonic approach to teaching of reading was of positive value to children now described as dyslexics. But the main reason why "everybody learned to read" was because, as with other handicaps such as language disorders, it was never recognized. These children were to be found among the maladjusted and mentally handicapped, or sitting quietly at the back of a large class. And still are. From our experience many parents find it a relief to learn that their child's difficulties can be labelled and that appropriate action can be taken. And why shouldn't they?

MOLLY PALMER, Head, ELA HUTT, Deputy head, The John Horniman School, Worthing, Sussex.

On the other side of the fence

Sir—I make two comments on points from the "special" article "Biology: the school route" (October 3) (September 29). First, the statement is made that "Asians, who could speak no English got far more attention than West Indians. This has led to language schools for Asians and ESN schools for West Indians." The question of the proportion of West Indian pupils in ESN schools is a proper subject for inquiry and debate; it is not by any means as simple an issue as is implied.

Second, you quote evidence (from the 1973 Select Committee on Race Relations) that "Church of England and Roman Catholic schools in England educate 15.4 per cent of the school population but only 7 per cent of black and white immigrant children." Maybe. But even so, what a splendid example this is of the masking power of statistics! In 1973, some of the C of E schools have black percentages (80 per cent plus) of black children, and the same time some nearby RC schools in the same "black" parts of the borough have no more than 5 per cent of black children. Indeed, one school building is shared by an RC school. On any school day, an amazed onlooker can see the RC primary school playground filled almost entirely by white children and, on the other side of the fence, the "white" infant school playground populated almost entirely by black children.

M. COLLINS, 101 Mayo Road, London, N.W.

Libraries first

Sir—As a professional librarian, I have some misgivings about school bookshops.

I am sure it is an admirable idea; anything that brings children into contact with the marvellous variety of books now available to them is to be welcomed. But what about the child who cannot afford the price of a paperback—even Puffins are not cheap these days? And what about the situation that has developed in my own school?

Here efforts to build up a large and attractive library stock, to meet the tastes and interests of the whole school community, and on free loan to all, are being frustrated by constant pilfering. This could be stopped if there was active support from those members of the teaching staff and sixth form whose voluntary energies, in lunch hours, are now devoted to supervising a book shop for the few.

ANNE CRUTTWELL, Madeley Court School, Telford.

INEQUALITY IN EDUCATION DOESN'T STOP AT DOVER

Peter Willmott is well-known for his sociological studies of Bethnal Green and for his book on East London adolescents. Now he has been turning his attention to Paris. This week's New Society prints the first results of his original research into inequality and schooling in the East End of Giscard's capital.

Also this week: Hilary Land on the myth of the male breadwinner; Max Beloff on why the state will wither; Richard Bourne on George Davis's 'media protest'; and Michael Wood takes a doll's eye view of the world.

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Who can settle these disputes

Sir—The William Tyndale dispute has once again brought to attention the traditional argument. As a traditionalist publisher, I pointed out to the Department of Education and Science that the proposed new curriculum for English in 1970, 1971 and 1972 was a possible conflict that could arise from the proposed new curriculum for English in 1970, 1971 and 1972. The proposed new curriculum for English in 1970, 1971 and 1972 was a possible conflict that could arise from the proposed new curriculum for English in 1970, 1971 and 1972.

In the first two cases, a young teacher is concerned with a risk of his career being permanently damaged, while an experienced teacher can survive and move on. In the case of a headmaster, the risk is more serious. He is not only a public figure, but he is also a person who is responsible for the school's reputation. He is not only a public figure, but he is also a person who is responsible for the school's reputation.

These procedures are only a stop-gap measure because of the difficulty of reaching decisions on available criteria. When we are faced with a system which is not working, we need to know how to weigh them in our minds. We need to know how to weigh them in our minds.

In a subject as complex as education, the growing need for some kind of a body to decide in the educational dispute, which seems most reluctant to accept a Teachers' General Council powers of registration, could help to resolve the dispute and bring a new vitality to teaching. This would be a time to set it up.

O. J. REYNOLDS, 75 St Georges Avenue, Newcastle, Staffordshire.

Casting the first stone

Sir—Frank Harris makes a radical suggestion when he urges that in traditional teachers be struck off. He is not alone. I have seen a number of proposals to set up a new body to regulate the teaching profession. I have seen a number of proposals to set up a new body to regulate the teaching profession.

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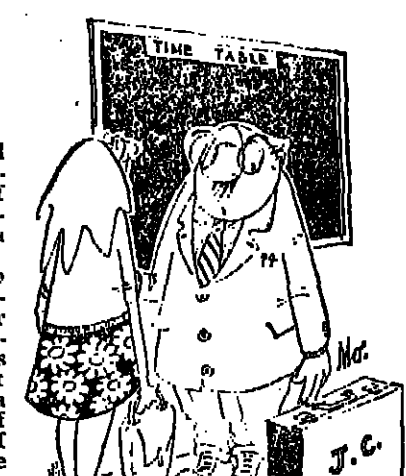
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"I've been taken off RE and put on the 3.10 to West Hartlepool."

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Common exam: the forgotten ones...

Sir—We presume that your headline "Examinations for all at 16 plus" (September 19) was intended ironically, particularly as, when we read the article on page three, we were reminded that the proposed new common examination at 16 plus is by no means intended for all pupils but is in fact for the "top" 60 per cent, however we are to define and then discover them.

Most of the major difficulties in English education since the war have arisen from our addition to the curriculum of a new subject, the Certificate of Education: Foundation. It is clear that little attention has been given to the needs of students in this area. Nevertheless, the joint examinations sub-committee who compiled the report call for a decision to be taken to replace O level and CSE exams "as soon as possible".

In its introduction, the report reviews recent changes in schools, with emphasis on the results of CSE. What is not mentioned is the related trend which began shortly afterwards of substantial numbers of youngsters going to FE colleges to convert CSE grades into GCE passes. These students joined the level of the ex-grammar school pupils who were already in FE, re-sitting GCEs.

No attempt is made in the review to explain how the new examination will affect CSE students, nor the more mature day-release and evening-class people who need O levels, meant to include pupils of all abilities on a single scale. We must

think in terms of techniques broader than traditional examinations, but the opportunity to achieve, as it is now before us. If we fail to take it, we may as well leave the present system, for all its faults, as it is. STEPHEN LOVE, Head, The Roundstone School, Lancashire, West Sussex.

Sir—The Schools Council's Report on the 16 plus examination and Certificate of Education: Foundation is cause for concern to the Further Education sector. It is clear that little attention has been given to the needs of students in this area. Nevertheless, the joint examinations sub-committee who compiled the report call for a decision to be taken to replace O level and CSE exams "as soon as possible".

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When one looks at the feasibility studies which support the recommendations, the short-comings concerning FE are alarming. Details of the experimental 16 plus examinations in 1974 show that, of a total of 69,769 subject entries covering 20 subjects, only 1,087 (1.6 per cent) covering 12 subjects came from FE.

The report also shows that in the summer examinations in 1974, O level for England and Wales, in English and maths no less than 81,000 (14 per cent of a total of 564,000) were subject entries from FE (59,000 and 22,000 respectively). In the same summer the AEB, an examining board favoured by many FE colleges, had an entry of 66 per cent for English and 57 per cent for maths from FE candidates.

When one seeks to ascertain how the 1997 subject entries were divided among different categories of FE students (full-time, day, release, and evening class) and how the proportion of the samples tested compared with the totals of the respective groups, no details can be found. If the Certificate of Extended Education is to be eligible for FE, and with the growth of the Diploma in Higher Education, assured, the time has come to review the general education needs of students in FE/HE.

PETER RICHARDS, Head of School of General Studies, Slough College of Higher Education.

...and a chance that was wasted

Sir—Now that many teachers are faced with a wider range of ability in any one class the proposals for a common examination at 16-plus are more attractive.

A group of senior biology teachers in Bristol started regular meetings in 1972, hoping to produce a more satisfactory course for mixed ability groups. Progress was rapid and teachers from different types of school found much in common. By mid-1973, a course had been developed, consisting of a common core of biology and six options, of which three are to be studied. The syllabus was produced with notes on the treatment of the various topics. Everything pointed towards a single examination for all pupils, and the teachers' group were satisfied that this was the aim emerging from the existing situation. The pattern which developed was similar to that used by some of their schools in Mode 3 CSE.

The schools were now ready and optimistic in their approach to the two local boards: South Western Examination Board (CSE) and Southern Universities Joint Board (O level). The boards were asked to look at the proposal and give advice and help to achieve a common examination at 16 plus on the syllabus as a group Mode 3 scheme. With CSE, the matter is quite different: SWEB have the monopoly in this area.

Needless to say we were (and remain) frustrated. The same syllabus was submitted and accepted separately by SWEB for Mode 3 CSE, and by SUJB for Mode 3 O level. Entirely different separate examinations had to be set for each board and teachers were forced to separate their pupils for exams (or, worse, enter). What a waste of energy and money.

ALAN CADOGAN, School based tutor, University of Bristol, Head, Hengrove School, Dr R. GLIDDON, Clifton College, on behalf of Ashton Park, Brislington, Clifton College, Hengrove, Monks Park, Portway, Withywood, and King Edmund, Yate.

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LETTERS

New ways to the core

Sir,—Could everybody (well, almost everybody) understand the calculus if they were given enough time? This question on mathematical education was triggered by the splendid article by George Walker (TES, September 28) which goes to the heart of the debate on cores, options and the whole business of a common curriculum.

If the answer is yes, then there is a strong case for permanent education, the opportunity to go on discovering and developing beyond school-leaving age. If no, then we should inquire at what age many children reach their mathematical ceiling and ask whether we should go on trying to flog them beyond their natural capabilities into a half-baked world of rote learning of formulae and numbo-jumbo about the set of all sets.

It is astonishing that no one knows the answer to my simple question, but the research programme at Chelsea College, CSMS (Concepts in Secondary School Mathematics and Science), should be able to give some pointers at the end of its five-year run. What has already been established is that most children up to the age of 14 still use the "concrete" mode of thinking, so that many of the abstractions foisted on them (deductive methods, logical symbolism, generalizations) are inappropriate.

The idea of core-and-options is unexceptionable in theory; it would be very dull if everyone enjoyed and profited by exactly the same course. But it is a non-option to replace mathematics by civic arithmetic or money management—this is simply throwing out the core. There are basic ideas and skills in mathematics, admittedly more readily agreed at primary level, which are the children's birthright. In the secondary school, these include (as a sample) the idea of ratio, degrees of accuracy, problem-solving with the chance to generalize to make up a better problem oneself, statistics, with chances to weigh evidence and make predictions.

Closed and open problems can be posed, with a definite answer to the first part (which can be extremely simple) and wide possibilities of extension by the able or more imaginative children. As a simple example, "1, 4, 9, 16, . . . , what

is the next number in this sequence?" could lead simply to the answer 25 or a long treatise on square numbers in general, with extra work on triangular or any other numbers which took the children's fancy.

We have been led away automatically from the old days of endless chalk and talk (although there is still a place for it). Children are different: they will solve their closed and open problems at different rates and different depths, so that some form of individual or group learning at least part of the time is inevitable. Such considerations have led to a number of local schemes, pioneered by Bertie Banks in Kent and typified by the ILA's successful SMILE (Secondary Mathematics Individualized Learning Experiment).

But there must be some age limit on mixed ability classes. The children get so far apart that the gaps between them can no longer be concealed under a cloud of different tasks on similar looking sheets. The right time to start setting children for mathematics is an open one, but it is certainly not 11, as universally and dramatically done in the past. Children blossom out so variously particularly between 9 and 13 that many schools are going over to mixed ability up to the second year in the secondary school and some brave spirits are experimenting even further. (The common exam at 16, plus will give them extra courage.)

But sooner or later some children will have selected themselves for work exclusively on paper (tough exams, higher education . . .), others will show the makings of the technicians, craft apprentices and so on. The most urgent problem in mathematics education at present is that of the children who appear to have reached their ceiling by 13, jog along sideways or backwards and by the time they leave school are unable, in the famous employers' phrase, "to make 3 into a decimal". Some work has been done for these children, notably by Peter Kaner's Mathematics for the Majority Continuation Project, but much remains to be done.

It is not a question of abandoning the core but of finding new ways of presenting it. After all, if the calculus had started in its original Newtonian state, it would never



have crept down to 0 level. This has been possible through simplified notation, curve sketching, intuitive approach leading to something more essential, and the use of CSMS and others) with paper-clips, etc. and transfer topic, without losing its essence, the concrete mode.

Mr Walker is right in saying that all school-based learning goes on in classrooms. . . . It has been a dream of mine to have a class for a whole term, say, fourth year, to one or two or three training establishments. . . . It has been a dream of mine to have a class for a whole term, say, fourth year, to one or two or three training establishments. . . .

This brings me to the question of relevance and commitment. Pupils. Years ago I announced principles for curriculum in mathematics and the sciences. Pleasure. Do the children their work? Have we lost proper sequences and made to the children's stages of development? (This again is a CSMS question.) Can the children's relevance of their work, today and tomorrow?

Purity. Is the work really able mathematics and not a mix of tricks?

Finally, how right Mr Walker is in questioning the help of the end-of-period bell and the examination questions. . . . such as CSMS can help to ease of our mathematical life, but of the remedy lies in the teachers like Mr Walker.

GEORGE WALKER, Professor of Mathematics, Centre for Science Education, Chelsea College, London University.

Weakness in building bridges

Sir,—George Walker says some very pertinent things. He takes the lid off the awful word "relevance" in education and reveals it for what it is, a synonym for the ephemeral and the second rate.

He is right to draw our attention to the dangers of "entertainment education" and "here and now knowledge", but, at the same time, alas, seems timorous about stating that education is concerned with an objective body of knowledge as well as the experience the pupils bring to it. He is wary of "formal didactic teaching", though the objectives are not happily wed and tied to the conceals of the teachers' recorder. (Why not simply, narrator?)

Thus, there is a suspicious vagueness when it comes to deciding what the common core of the curriculum is and what the concepts of its parts

are. We are told, it is true, of children who "can't concentrate for long", but all will be well if we give them the right conditions. (Whatever they may be) and if we effect direct contact with "judiciously chosen material" (whatever that may be).

To achieve success with all abilities, for some "alternative tactics" may be required (whatever they may be) and history (for example) may be required to give the "history in a different way". (What way, though? I fear Mr Walker may be back with his integrated studies or contemporary studies.)

It is a pity one has to qualify one's praise for so much in this book, but the vagueness lead me to believe that Mr Walker's "bridge between the formal subject and the intuitive personal experience" may crumble. The conceptions he seems

prepared to make for a core run the risk of all the plagues within forms and to lose their healthy objectives. That, where English literature is concerned, for instance, shall cease to have any meaning and simply be the vital pupils seize upon it as "tragic".

Mr Walker clearly wants to serve education from a more meaningfulness. It is a pity not more resolute in his support of the teacher and building the authority of a firm curriculum. The bridge between the formal subject and the intuitive personal experience may be enhanced by, but not founded on, the experience of pupils.

GERAINT LLOYD-EVANS, 54 The Wick, Bengoe, Hertfordshire.

Abolish local examination boards

Sir,—Concerned teachers have from time immemorial condemned examination boards. . . . demands that what you like—and what you dislike—be something positive. We poor classroom teachers of English will have to shop around the various examination boards for the least offensive English syllabus.

After 10 years of teaching and examining English I think almost any O level examination in English is fairer than its counterparts run by the CSE boards, particularly the Southern Regional Examinations Board, which covers Oxford schools.

The O level boards offer the separate papers in English, one on language the other on literature, while the CSE board ignores this important distinction. Many CSE boards, which cover Oxford schools, have failed to gain a Grade 1 in English because of a brilliant performance in the language papers that has not been matched by a similar effort in

literature, which requires five terms of hard work to complete course work. Some candidates entered the CSE boards because they were secure comfortable passers in the former, while they could have only a Grade 2 or 3 after much preparation in the latter.

As well as two written papers and course work, CSE candidates must prepare for an oral assessment which involves reading and conversation about a topic of interest. Candidates who achieve a Grade 1 at CSE do not receive two awards as they should—one for language and the other for literature. When applying for higher courses of study, the CSE board is at a disadvantage.

Grade 1 at CSE is required for the successful CSE Grade 1 candidate in English finds that he/she is a definite loser because in real terms one needs 6 CSE Grade 1s to have brought this anomaly to the notice of the GREB, at conference I have asked for two Grade

1s for such a vast English syllabus, which works against the interests of the pupils, and the CSE boards pretend that in reality they are more concerned when the aims of home and school are in conflict.

The teacher's prime function is to ensure that the child takes place, just as a child is necessarily born, because he has to learn and he must learn because he has to live. Freedom to paint all day, a detailed study of the great driving force in the world, the child, is not a luxury, it is a necessity.

Teacher needs to be continually evaluated. It is happening to the children in written responses that John is more than a month or less term? Does the teacher's response suggest that his own mind is not working? Does he indicate an awakening purpose and ability, hitherto dormant? Does he give the impression that he can feel his own per-

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Talkback: Book of the Year competition

books appearing this term have brought into focus some special questions facing teachers. In extracts from their books, Henry Pluckrose defines the role of an "open" teacher, Michael Marland examines the importance of the teaching environment, and Albert Rowe suggests how English teaching can best meet children's real needs; and in a special introduction to his new anthology of children's writing, Chris Searle looks at the political aspects of classroom work.

The books

Henry Pluckrose, *Open School, Open Society*, Evans, £3.95Michael Marland, *Craft of the Classroom*, Heinemann Educational, 80p (to be published 20 October)Chris Searle, *Classrooms of Resistance, Writers and Readers*, Publishing Cooperative, 85p (hardback £2.75)Albert Rowe, *English Teaching*, Hart-Davis Educational, £3.50

The openness is all

'We should not seek simply to prepare children for life. Most of them cannot wait that long. They are alive now.'

usually emerging from the embryo that is childhood? Can his parents see change—and do they appreciate and understand such changes as they happen?

It sounds trite to observe that the task of our schools is to "teach children how to learn". But it also seems obvious from a superficial analysis of contemporary society that the "celebration of learning" has taken place for far too few of our young people. The subculture of one-armed bandits and bingo, hysteria and violence which accompany pop concerts and football matches indicates only too clearly that if celebrations are to take place they are certainly not ones in which our schools can take pride.

But learning, you may say, is what schools have always been about. Indeed the open teacher of my ideal will continue to teach children those things which are useful for their development. A child of eight who cannot read will be unable to benefit from the richness of the school environment as much as those of his age group for whom reading is almost an obsession; or again, a child who is extremely creative in words but of little value to society if the words he writes are unreadable.

It is here that formalist and non-traditionalist meet. I believe that we should be developing skills in English and in number to improve the quality of the child's response to the experiences which school is giving him. But we should not seek simply to "prepare children for life". Most of them cannot wait that long. They are alive now.

The second goal of the open teacher is as fundamental as the first—but in a social dimension. Charles Silberman in *Crisis in the Classroom* suggests that the informal school does not achieve greater academic standards than its formal counterparts (nor, incidentally, does he suggest that they achieve less).

However, the informal school tends to excel when such qualities as self-confidence, independence, responsibility and social grace are examined. Thus I see the open teacher encouraging children to be aware of their own gifts and failings, encouraging children to think and make decisions and to act upon them. Is the teacher helping children

to become creative (in whatever area is most appropriate to the individual child), are the children articulate, do they participate in the creative process? Children do not grow up what is and prepare children for what will be—rather than simply to preserve what was; to foster the living rather than to be keeper of the archives of the dead.

The teacher who can continue to ask herself how well she is responding to changing circumstances will help prevent her classroom and her school from becoming hide-bound by irrelevant practice. New approaches to education can quickly become so stylized that a whole new orthodoxy can be born out of change. And there are dangers. The orthodoxy of any practice applied as a philosophy by those who have not thought it through or challenged its relevance to their own circumstances is most likely to be a creed doomed to failure.

All of this implies, I suppose, that school is a living organism rooted in the present rather than in the past, staffed by teachers who see teaching in terms of interaction: interaction of the school as an institution within the local community; and, on a smaller scale, interaction of the individual teacher and the individual child.

At this level teaching can be seen as the exchange of ideas and ideals between two people: the one experienced in the business of living, the other a mere novice. The teacher in this human dimension plays her most vital role, she can take the children and then determine a pattern of living and learning within the classroom that is most appropriate to their corporate and individual needs. If this natural interaction of teacher and taught determines the pattern of the school day, then the timetable (the very nature of which tends to restrict and define human contact rather than deepen them) could become a thing of the past.

In place of the timetable the good teacher provides a subtle substructure for the children in her care, determining what aspects of school work are free, what are prescriptive and in what areas of work children may follow and develop individual talents. Freedom is allowed as appropriate to individual children and to groups. This plurality of purpose does not lead to chaos, for the teacher provides the means of integration into the whole. In other words, the teacher's aim is to provide a broad framework within which the children work.

Ways of implementing this structure cannot be definitively described, for they will vary from teacher to teacher. On the one hand, older children might be encouraged to keep a record book detailing their activities, noting both work which has been completed and work to be attempted. On the other hand, younger children would probably simply respond to the expectations (often unspoken) of the teacher with whom they are working.

But, however the teacher works, the security which comes from a clear understanding by each child of the part he plays in his own learning programme is vital to the educative process. Children do not grow up in unity, chaos, however friendly. "Freedom" remarked the American educationist John Dewey, "is not an original possession or gift—it is something to be achieved and wrought out."

Staff involvement at this very personal level, however, could present problems if the general emphasis within the school lies in some other dimension. I am thinking here of schools which have no clear philosophy, or where respect for administrative nicety appears to weigh more heavily upon senior staff than staff, perhaps, but one member of staff, is necessary. If a member of staff is to be made to change the pattern of life and work within any school, it is vital that a real attempt is made to clarify the objectives and aims of the new regime before any fundamental changes are implemented. This is an obvious point, perhaps, but one which needs to be made. I have met many teachers who have told me of the frustrations which result when piecemeal changes are thoughtlessly and haphazardly introduced.

The teacher who is following an integrated programme will of necessity rely upon the support and understanding of her colleagues: children will be less desk-bound and classroom-oriented. Sharing of responsibilities can only be happily undertaken by adults who have a common vision, and the task of the headteacher is to see that this vision is appropriately determined, is corporately understood and implemented.

Henry Pluckrose

Henry Pluckrose is head teacher at Prior Weston Primary School, London.



The answers to the first are obvious. Almost any theme can be used as a centre around which a teacher may build units of work in which he involves his pupils in all the kinds of linguistic activity he believes necessary for them at that point in their stage. Many of these activities can grow out of the theme and in fact be organically related to it; some have to be linked to it artificially, but may be none the worse for that as there is no harm in being enlightened.

The syllabus and schedule of work lay down the course to be followed and ensure that the activities the themes give rise to develop and progress logically and coherently. The factual content of the themes can in terms of the syllabus be arranged. But this does not mean that the teacher has no freedom to improvise and promote variety. There is.

For instance, in the early years one can ensure that the speaking and writing will be mostly personal and expressive, based on the child's own experience. In the intermediate stage, the themes can be more generalised, analytic and analytical, i.e. more cognitive, though the information and knowledge handled may still relate prominently to the child's own experience. In the final stage, more general interests, which at this stage may include scientific, become more prominent.

The theme, then, can be a centre by means of which the interplay of linguistic activities can be given significance, purpose, direction and direction, stimulating thinking, developing imagination, encouraging speaking, acting, and, not least, writing, ranging over the gamut from the personal to the impersonal, action and role-playing (such as drama), all of which can be coherently involved.

It is not, of course, that all good themes are the trivial, trite, and obvious. A number of interrelated and interesting questions. An English teacher, if he is keenly involved

his pupils in the learning process, he has begun with where they are. This subject matter is in essence their life and their world, their interests and their preoccupations.

Yet some of their expressed interests and preoccupations may be trivial and ephemeral. He may feel compelled to use it as his subject matter, however, because it is at this time relevant to them and so occurs in the best means of involving them in learning. How, if at all, does he treat this shallow and shifting relevancy? Is there a real dilemma? Not necessarily.

A woodwork teacher can conduct his affairs with his pupils in a more humane, liberal and civilised way than an English teacher, because, working as he does, he will teach certain virtues and values. Trivial and ephemeral topics in English can be handled in the same manner. The subject matter may be less good, but it can also be linked to many and many other things which are good and useful.

The essential trick is to use, to reach the pupils' expressed interest, but also as a point of departure. For example, a topic on soccer could lead to the most searching consideration of good sportsmanship, amateurism, protection of property, respect for the rules, violence, damage to property, etc. It is to use and abuse the mass media make of sport.

I'm not suggesting that woodwork provides as many opportunities as English for emotional, imaginative and intellectual development on a trivial topic as many as a more worthwhile one. A teacher's duty is to distinguish between the trivial and the ephemeral, and trivial with care and discerning from their more basic and lasting uses. His subject matter is life itself, true, but he should construct his course mainly from those subjects which are either timeless matters of fact or which have a scope, for that, to be drawn out. For those that are not.

Some teachers feel they should be feared and allow pupils a completely free choice of

topics. But neutrality is itself a choice as to liberate and selective as that of selecting themes on the basis I've suggested. To abandon the burden of choosing themes under guise of freedom and neutrality is to choose not to face up fully to one's responsibilities. It need not however, be an either/or situation. A flexible English department can have the best of both worlds. It can construct the course and make the syllabus and scheme mainly around themes of deep and abiding relevancy, in which matters of importance can be dealt with. I emphasize that their treatment must not always be solemn. Humour should keep a broad and healthy development of a sense of humour is in itself a matter of importance in each of our lives).

Themes selected by a pupil and not contained in the course can easily be accommodated. The teacher is readily inspired by his own clients, he will readily respond to such a theme. He can find it more probably engaged in it than he would be on a course theme. If a teacher judges that he ought not to miss a course theme, he could be asked to pursue his own theme as an extra, encouraged by being allowed at times to go on with it for homework instead of what's set.

There is one important step that can be taken to make sure that a pupil does not choose his own selected theme as a "safe" one. Files for current pictures and teacher-duplicated sheets on each theme should be built up. Housed in filing cabinets or computer-managed sets of file drawers they should contain information, specific references to articles and news items in the school, or local, literary and mass media. In all, and these should give suggestions for developing the various aspects of the theme itself and of areas related to it. There should also be a selected sheet.

The chosen teacher is not the sounds. Pupil answers are not the words. The chosen pupil

In the main the same themes. They raised first on these in the knowledge they will be as much in demand in years, as now. For instance, a question circulated to 3,000 pupils, aged 12, asking them to put down things they had learned, not actually in school, but in the world. Surprisingly, a large proportion, about 20 per cent stood out as popular by the majority. These were of sufficient relevance, true matter of importance.

A teacher need not fear that his leaning on his pupils' common sense together in this way, because the common sense of fundamentally and importance, most pupils are only too ready to involve themselves in them. He need not such themes himself or use them as a hook, adding, adapting, and making them as he thinks fit. It doesn't seem a slight disadvantage so long as he is able to choose to serve his purpose. He is held in certain quarters that the world, between hard covers is bad and the thing in a package, published by a publisher is good won't bear a moment's examination.

What's been said about pupils' common sense, the shift of emphasis from impersonal uses of language to the need for impersonal uses to the time and attention in the latter years, mentioning the others, not denying the clear implications for the choice of the matter. If the uses of language are mainly personal and expressive in the secondary years, then the teacher must be those which provide the opportunities for these uses.

The advantage of a cyclic principle is one can treat matters of 'general importance' in the early years in a way, and then appropriate to the age group, then return again later, to teaching them in a different and different level. There are areas related to these themes that are untouched earlier and broom to be brought to ways, the golden time to engage the sympathies, to carry the truth the pulse into his heart is from 11 to 14.

If the foundations of an English are attempted to develop, a pupil's needs are not laid down, but he must be more humane, more sensitive, more fully a more humane, more sensitive, more fully a more humane. This is a view that will be more road later. This is a view that will be more road later. This is a view that will be more road later.

which a teacher should not be so much shape his treatment.

Alfred Rowe was formerly headmaster of Lister Comprehensive, Kingston-upon-Thames.

A Regency theatre audience. This Rowlandson print (1809) is taken from Victor Glasstone's "Victorian and Edwardian Theatre. An Archeological and Social Survey". (Thames and Hudson £6.00, Paperback £2.95.)

There are many moments when the most amiable reader will be flushed by the sudden glory of Hobbesian exultation; what a delectable prospect opens before him! He has, fortunate that one has, not contracted to read it. But even the most cheerful reader will frequently pause to commiserate with Allardyce Nicoll and Robert Curjel. During the only two men in the world who have exhaustively explored the depths of this unproductive mine. Near the beginning of his critical profession, Dares has a list of pleasures from their authors and dates and it tells us that these are "not productions to which one can turn with pleasure, nor, having seen them, can one ever wish to read them again." During the discussion of the remaining part of the 50 years, such lists cannot be avoided. They are part and parcel of the thing, the moonlight nights of Corgett, Crane and Clyne."

This volume fits very uncomfortably into a series entitled "The History of Drama in English", because the overpowering interest in this period is in the theatres, the actors, the audiences, and in the changing relationships between various theatrical activities and the literary and social contexts. The editors and contributors have made a brave attempt at a task more thankless than any other volume in the series will present. There are useful chronological tables, a descriptive list of the theatres of the period, handsome illustrations, and a bibliography, guides for further reading. Michael K. Booth is informative and interesting in his section on the social and literary contexts. Richard Southern discusses the crucial developments in stages and stage machinery with his accustomed clarity and vigour; in the fourth part, on actors and reputation, Frederick and Lionel Lee forcefully demonstrate that the attraction of the theatre in this period depended almost entirely upon the succession of great actors—Garrick, Kemble, Siddons, Keen, Macready, Barry, Phelps, and Kemble, and, finally, Irving; these names, said by a passing light to pages darkened by the hoards of duncelings dedicated to their goddess's unceasing word.

[illegible]

deed, that there have even been signs of a slight reaction: one or two recent critics have stoutly maintained that Morris's strange flair for publicity still has its effect today, in that his own rather rigid and repetitious designs are automatically favoured above those of more gifted but less publicized contemporaries.

Equally, there is more than one opinion possible of the books produced to Morris's designs by the Kelmscott Press in his last years: not everyone finds their rather claustrophobic semi-gothic quality appealing (though enough do, again, to have pushed their prices sky-high). And it would probably be exaggerating to suggest that there is much controversy at all about his story, which for many years has been to have considered, and others certainly considered, his most important sphere of activity. Who now, a few specialists apart, reads *The Earthly Paradise* or *Sigurd the Volsung* or even *The Life and Death of Jason*? Interest is effectively confined to a small group of medieval balladists and a few poets who, for literary reasons, have been many of them never published until after his death and some of them never properly scrutinized until Mr Lindsay turned his eagle eye on them in this new book. True; there has been a curious revival of interest in the more 'crabbed', less readable of the later prose romances, which came back into print in popular paperback editions of a stylistic variety that went on for years when they were finished with Tolkien. But how, their author would have felt about his new audience is open to speculation.

So, Morris remains very much the known unknown, some of his work very familiar and the general outline of his life and activities

quite well known, but the man himself somewhat out of focus. This is where Mr Lindsay's new biography comes in. In it he sets himself the task of synthesizing the various aspects of Morris which have received separate treatment—his political beliefs and actions, his writings, his love life, his private life as it has gradually been revealed, mostly in marginal glosses on the lives of other, more immediately colourful figures in the Pre-Raphaelite constellation—and producing a coherent, comprehensible picture of the man in relation to his work, his time and his immediate personal context.

In this ambitious undertaking he succeeds remarkably well. We get in full detail the strange emotional entanglements of the circle, particularly in the early 1870s, when Rossetti was having his affair with Morris's wife, Janie, while Morris was in love (though with what physical expression, it is not clear) with a young girl called Jane Burden-Jones's wife, George, and meanwhile Burne-Jones, the mildest of men by all accounts; was having his improbable affair with the tempestuous Maria Zambaco. The story is bizarre, and not without its comic aspects, but clearly revelatory in the light it casts on the inner nature of Morris, who tends to be seen more often in the light of his emanation from the artist's family view of Macaulay's biography and the manual volumes edited by his daughter, excessively robust and unemotional.

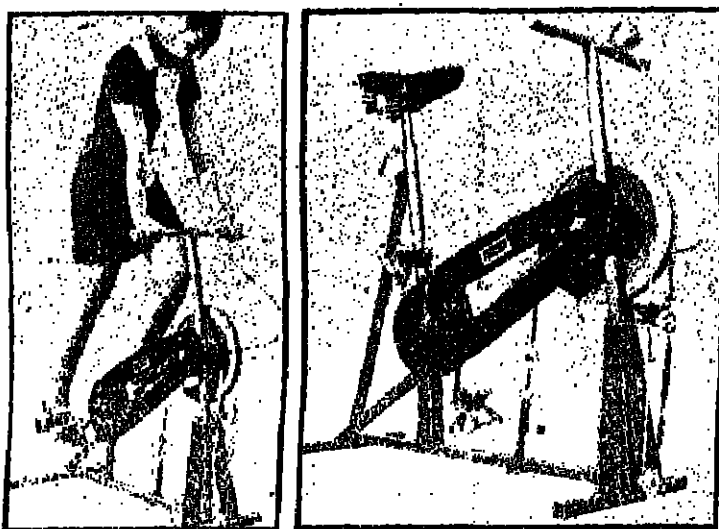
Mr Lindsay is also, as one would expect, excellent on the development of Morris's political and social attitudes. He is the first writer really to disentangle the influence of the late 1840s Manchester College of Socialism, Morris's last year there, which, whether or not he took any direct part in

them, must have had their effect on his subsequent resistance to oppression and his particular sensitivity to the oppression of children. He also goes into systematic detail about Morris's personal finances, the decline of his private income and the whole monetary aspect of the businesses in which he later involved himself. He makes particularly good sense of the apparent contradiction between Morris's socialism and the inescapable fact that throughout his career as a writer and a businessman (which, for that matter, was his only career) he was primarily, and exclusively, involved in producing work of the kind which could be available only to the rich elite and could be enjoyed only by the leisured and well-educated. In this context, particularly, Mr Lindsay's work on earlier precursors of socialism, such as the many nineteenth-century groups involved in the various plans for utopian communities, which is so immensely useful, in that he can see Morris as part of an obscurely and capriciously developing tradition rather than merely as a primitive embodiment of something defined largely in twentieth-century terms.

Above all, though, his book is compulsively readable. For a scholar, Mr Lindsay is a rare thing, a scholar who can write as well as he can marshal his mass of facts into a fast-moving narrative which holds his reader in thrall from page to page throughout the book's not inconsiderable length. An enormous amount of reading and research has gone into the book, but its learning is woven so lightly into its narrative that it is almost as if the learning had been in the author's bonnet are becoming and enlightening. Morris will never seem the same stuffy great Victorian again.

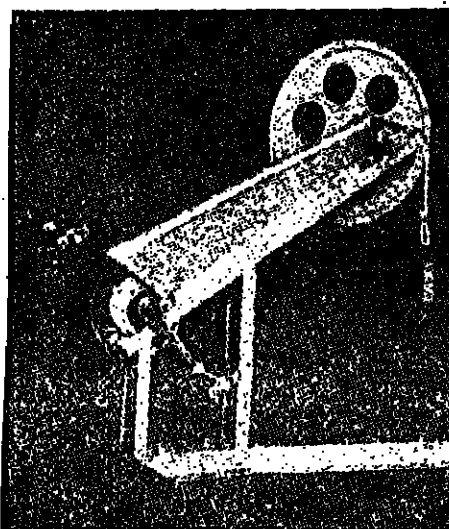
34 Resources

Bicycle Ergometer by Irwin Desman



Left: being used in the standing position. Right: unit with the saddle accessory EM69/C added to the basic machine

Griffin's Bicycle Ergometer



continued from previous page

power output will have been done with Newton sandbags and the abandonment of these may lead to teaching complications; secondly, should the load slip and fall, stored masses create more chaos than one solid sandbag.

The bicycle ergometers are more fun to use. They consist of a frame with a pedal driven sprocket wheel mounted at one end coupled to a geared pulley wheel of 1m circumference by an enclosed chain. The subject operates the pedals against a load and the force acting against this can be measured enabling the work output of the subject's legs or body to be calculated. As with the arm ergometer, all measurements are SI units and so the power output figure is calculated in watts.

The Irwin-Desman basic model consists of a robust but extremely heavy and non-portable, all welded, square tube frame with a pulley wheel at one end and a sprocket wheel at the other. The sprocket wheel is fitted with a rubber tyre. The handlebars are provided. There is a rope brake which can be attached to a force meter at one end and a sandbag load at the other.

If two force meters (0-100N) are used it is possible to vary the effort required to turn the pedals by adjusting a screw tensioner, a relatively easy operation.

There are six sheets of apparatus notes, containing detailed, easy to follow, illustrated stages for the assembly of the basic machine (which is assembled to "facilitate transit and prevent spillage") and for fitting the accessories. Once assembled the machine does look like a stationary bicycle and is ready for use.

The saddle is supplied as an extra but the subject can either stand on the pedals (for measurement of the

body's power output) or sit on a stool placed behind the sprocket wheel (leg output). The latter is satisfactory if a small effort is required to turn the pulley wheel, but should a greater effort be needed there is the possibility of the subject falling back off the stool. Such accidents can be avoided if the operator is seated on a fixed bench (as recommended in the Philip Harris catalogue).

Even though a revolution counter and speedometer are so-called "optional" accessories it is difficult to get useful results without them. It is possible to count the pedal turns (not always a reliable total) and then convert this number to pulley wheel turns using the gear ratio—but a revolution counter mounted on top of the spindle housing of the flywheel makes life much simpler. It is easy to read from the operator's position but it is awkward to adjust to zero owing to the location of the adjustment screw.

The speedometer is calibrated in Kph and it fits on the handlebar of the machine in full view of the operator. It is tempting for anyone to see how "fast" they can go, how "far" in so many minutes but as this is not the purpose of the exercise it would be better if an arbitrary scale could be used. (The speedometer is a help to the operator maintain a steady rate and it could be substituted by a metronome).

According to the catalogue instructions for calibrating the unit to read in rev/sec are in the "apparatus notes", but no mention could be found and these referred to the Nuffield catalogue. A pity such extensive instruction notes are spoiled by this omission. The apparatus notes also include comprehensive operation instructions, nuffield examples and hints on maintenance.

The basic Griffin bicycle consists of a welded angle iron frame with a rubber anti-slip base. The pulley wheel is metal with six circular holes. The speed ratio is 4:1 and revolutions of the pulley wheel are registered on an easily resettable revolution counter—this time not an optional extra.

In this model the rope brake is fixed to a 0-5N force meter at one end (do users of the Griffin model have less powerful legs than those of the Irwin machine?) and the opposite end has a loop for the attachment of the mass hanger. The special hanger (L03-112-070) must be purchased as the standard type is too long. The other extra is the speedometer; as a saddle attachment and handle-bars are not available, this ergometer does not resemble a bike.

As with the arm ergometer there are no instruction sheets produced for this Griffin model, so one must rely on the Nuffield texts. When used, the operator has to sit on a stool or bench to turn the pedals, operation in the standing position is almost impossible. When an "unfit" subject operated the ergometer with a "20N" load, the power output of the legs was found to be 120 watts, which makes comparison with a powerful light bulb possible.

All the pieces of apparatus described are expensive, though costs can be reduced by "doing-it-yourself"—assuming that the teacher is capable of such work or that cooperative and enthusiastic technicians and a workshop are available. The major difficulty such homemade efforts must overcome is the construction of a wheel of "round-number" circumference to make calculations easy.

The topics of power output and ergometer use are sadly neglected in biology as a cursory glance at any existing text or syllabus will show. This is illustrated by one of the handbooks from the Griffin Technical Studies series: in *The Human Machine* there is passing reference to ergonomics (making life comfortable) but no mention of ergometry (making life difficult)—an unfortunate oversight. The omission could reflect the reluctance of many biologists to pursue topics that make even the smallest of mathematical demands.

A clue to attitudes about ergometers can also be gained from the Philip Harris catalogue where the items are included in the physics (energy conversion) section. This is the logical place to put them, but does it mean that Harris's think that physicists are the only teachers likely to purchase them? Ergometers were developed for and are a feature of integrated science courses. They can be an excellent example of pieces of apparatus and investigations that straddle all the scientific disciplines.

If the cost of purchase is shared by several departments the apparatus can be used for energy studies in many different courses and even biologists may be shaken from their reluctance. Integration could even stretch to the PE department, where the ergometers could be used in "keep fit" campaigns—if nothing else.

References: Nuffield Secondary Science (1971) Theme 3 Biology of Man. The Nuffield Science Apparatus Guide, London, Longman.

Teachers, change and resource-based learning

NEIL MUNRO on the ICEM conference

The modified role of the teacher in a system of resource-based learning was a subject taken up by several speakers at the annual conference of the International Council for Educational Media in Glasgow last week.

Mr J. Mertens, inspector of audio-visual aids at the Belgian Ministry of National Education, said that Belgium was a long way from its agreed targets—a resource centre in each school, an internal distribution system in large secondary schools, and the establishment of a few regional inter-school resource centres. He acknowledged that this was a huge effort for an educational system which was only now emerging from "total power to the teacher".

Would teachers, he said, be willing to accept reductions in formal course-teaching to allow pupils to undertake multidisciplinary study projects? "And especially, will we be able to prove to them that individual or collective research is not necessarily a deviation from the route which, according to them, should lead directly to a knowledge of prescribed subjects?"

Mlle Annie Bireaud, of the Institut National de Recherche Pédagogique, Paris, said that a changed role for pupils was also implied. In self-teaching pupils use a teacher as they would a book, a film, a video machine. The teacher informs them directly, if he knows the answer, or indirectly, by indicating another source of information. The teacher's importance was not necessarily reduced since he was still on the same footing in relation to his pupils' relative lack of knowledge.

The teacher should be able to communicate his experience of general methods of working—i.e. how to use a filing system, how to establish the reliability of a particular source of information, how to analyse a text or an image. The teacher in a resource-based system is therefore asked to become adviser and specialist rather than master and generalist.

Mr John Clarke, coordinator of

learning resources at Dundee College of Education, said that teachers are the purveyors of knowledge, only recently become engaged in the process as opposed to the one development and production of learning materials. These he left to commercial publishers and organizations such as the IBA.

In the case of primary schools it soon became clear, once analysed the structure of the fact, that they had no knowledge of the psychological basis of learning of mathematical concepts. It was, therefore, "unreasonable" to expect primary school teachers to put in curriculum developments.

They have reached this point. Traditional training has to equip the teacher with technical equipment and to put in the curriculum development. The traditional teaching of mathematics was that of a publishing house, duplicated in textbook illustration, selected image and diagram—were supplemented by taped printed materials, and graphic prints and halftone film and television lessons.

Mr Martyn Roebuck, head of the Scottish Education Department, said there was an evaluation of resources based on the curriculum. Educational resources proceeded to their own, as part of the curriculum movement. There was little with the work of practical decision-makers.

Evaluation of different resources is not a simple task. The teacher must consider the interactions between methods, learning process to be developed, the content of the materials, and the resources themselves. Without these considerations, resources are produced and used in a way which is not particularly educational.

Mr John Clarke, coordinator of

Rate support

The Local Government Training Board have published a role-playing exercise which illustrates the procedures which county councils use to fix their rates.

The subject of finance that produces yawns from most of us, admit the board, and when combined with the intricacies of public expenditure and democratic control, it is guaranteed to bewilder and bore.

Sensing in addition that most people regard rates rather as fines imposed for a misdeed than as a necessary part of life, the board has decided that the best method of education is to put the sixth-formers, college tutors and adult students for whom the course is intended, into the shoes of the decision-makers.

Up to 35 people can use the exercise and participants are divided into four service committees. Each group is given detailed background information. The Policy and Resources Committee recommend a growth rate; service committees then submit their estimates and position to the Finance and Planning Committee. The Finance and Planning Committee then submit their estimates and position to the Finance and Planning Committee. The Finance and Planning Committee then submit their estimates and position to the Finance and Planning Committee.

The exercise concludes with a council meeting at which the rate to be levied is fixed.

The material is published in two parts: the tutors' material, including detailed supporting notes on the organization of the sessions and a worked example of the sessions, which costs £4 (£2 to local authorities, colleges and schools); and the participants' material (for up to 35 people) which costs £12 (£6 to local authorities, colleges and schools).

A review will appear shortly on these pages.

Local Government Training Board, 8 The Arndale Centre, Luton LU1 2TS.

Shiny smiles

Preventive Dentistry on Film. Mares Health Education. 16mm. 30 min. Free loan or £25.00.

This set of slides with explanatory notes is not only a valuable aid for teachers but can be hired for up to six weeks and is free of charge, if you are a teacher. The slides show how far dentistry has come in its filling and pulling and its teaching notes are very and 10 to read—glorious pages of notes. Prepared by Marshall, the chairman of the British Dental Health Federation, the slides are not designed for a specific age and can be easily understood by ages; older pupils will be fascinated by the simplicity of the text.

Such matters as the common dental diseases, oral hygiene, brushing, flossing, disclosing, fluoride, fissure sealants are covered. The amusing cartoon slides contain lessons on plaque and the common dental diseases.

Mares Health Education has obviously paid heed to the comments of teachers and has produced a set of slides which are not only a valuable aid for teachers but can be hired for up to six weeks and is free of charge, if you are a teacher.

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Ideas, argument, experiences and research

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TALKBACK

Teachers' Christmas book competition

Community education
Latvian
village

Casting a wide net

Vladimir Daukshta

A little village school in the fishermen's community of Lapmezhts in Latvia has been setting an example in education to the more sophisticated urban educationists of the republic. There is not a single backward pupil in the school.

The building is situated among the dunes and pine trees about 200 metres from the sea. Two hundred boys and girls study there, and most of the teachers also received their schooling in its classrooms. The children are on to specialized secondary schools and universities. If they intend to return to the village they get a special scholarship grant paid by the fishing community. Nearly all of them come back.

"Our success is based on the cooperation of the family, the public and the school," says the head teacher, Ilona Kauka. "Of course, there is similar cooperation at other schools in the country, but the difference is that all the adult population of the village take part in the children's upbringing."

The teacher-public committee of the school includes village councillors, trade union, youth and fishing cooperative representatives and of course, teachers and parents. Headed by Ilona Kauka, the mother of one of the pupils, the committee has three sections—educational, cultural and economic.

The educational section is responsible for the preschool training of five and six-year olds, to be more exact, the true day of their parents. The children start school at seven. Fathers and mothers are taken to ten-form lessons at school to see for themselves what seven-year-olds children have to know. After two or three months they can prepare their children for school, and the teachers know all about a child's abilities, interests and inclinations, and also about its family when it starts school.

The teachers have to know the specific character of a fisherman's work. The fishing season lasts four to six months and the fleet is far from home. Everyone is particularly anxious to children whose fathers are at sea. When the fishermen return home the committee have discussions with them about their development and psychology. Special days are arranged for the parents to sit in on lessons.

The committee pay serious attention to out-of-school activities. The library is one centre where the children love to gather. The librarians discuss the books with them and recommend literature. The children are, in fact, the leading propagandists of new books among the fishermen.

There are more boys than girls at the school, but the teachers are mostly women. So young men, usually former pupils, are drawn into the work of teaching technical crafts, amateur theatricals and sports.

The cultural and economic sections of the committee are concerned with the social, moral and legal education of the children with career guidance and development of industriousness. For many years there has not been a single case of a pupil breaking the law. It is believed that this is a direct result of the channelling of their interests into creative pursuits.

Not a single important event in the life of the school takes place without the participation of parents and public. Yanis Polugan, a fisheries worker, teaches the children how to use simple navigational instruments and set the ship's course; neimaker Yarne Egle shares with them the secrets of her trade; while the fish-canneries show them how to smoke and pack fish. Every year a number of the school's pupils win places in the navigation school.

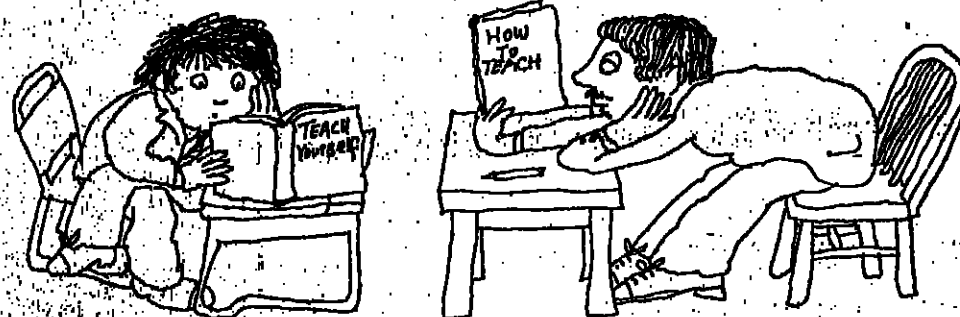
The fishing cooperative do a lot to help the school economically. They repair the building every year and purchase new equipment and visual aids. They also pay the supervisors of hobby circles. The children receive free meals at school. Every week theatre outings to Riga are organized for the children and the parents. The cooperative loan them a coach for the trip.

Fishing is one of the major industries in this Baltic republic, but with the increasing sophistication of the industry its future prosperity depends in large measure on having well-educated fishing communities satisfying the wider cultural and social aspirations of the young people.

With the introduction of universal secondary education, the parents, public and local bodies of Lapmezhts are concerned to rear a generation of young people proud of their heritage, involved in the social progress of their village, and assimilating all that is good in world culture. Their efforts reflect a national trend to discourage the drift to the big towns by putting the best in the children's upbringing at the disposal of small communities without destroying their local character.

Vladimir Daukshta is a graduate of the Latvian State University.

Review it yourself



During Christmas, we hope to have on the Talkback page some views from teachers on which the book has made the greatest impact on their teaching during the past year; and why. The book need not be confined to books designed specifically for use in schools, or books about education—any work which has significantly

affected how teachers work with their students, or with each other, could qualify.

Please send all entries, which should be no longer than 150 words, to the Editor (Talkback), by December 1. A book token to the value of £3.00 will go to anyone whose contribution is published in the TES.

COURSES

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Full details are available from the University of Exeter, School of Education, Gandy Street, Exeter EX4 3LZ.

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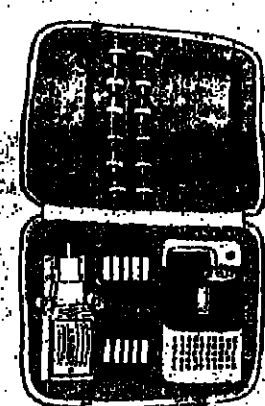
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Children in limbo

Naomi Mitchison highlights some disturbing aspects of Botswana's school system



Left: few children in Botswana get the benefit even of the basic facilities enjoyed by these Nigerian children. Right: rural area quite isolated from the capital, where decisions on education are made.

The educational system in Botswana, and in particular its distressing results, are exemplified by the situation in the Kgatleng, in the south-west part of the country.

Out of 925 children in Standard 7, the top of primary school, 233 passed the examination, which they must take in order to qualify for secondary education, but a few were too old (over 16) to be allowed to enter. These were the As and Bs, but there were also 461 Cs, which is a bad result, and some Ds, which is rock bottom. The government secondary school managed to take the As and Bs, the private secondary school the best of the Cs and the over-age Bs. Both schools took in a few children from outside the Kgatleng area. Secondary school fees are a lot higher than primary, and many families, especially if, for example, the father is dead or has gone away, cannot afford them. Those in the government school can get bursaries. The Mochudi private school, although recognized and even praised by the Minister of Education, cannot get bursaries, so children have to depend on outside help. This school is on self-help lines and has a lower standard of material comfort than the government schools, though high enough, one would think, for a country where most of the citizens are very poor.

But the great bulk of the primary school leavers are left in a limbo, with no future. Their primary education has not helped them, except that they know enough English for begging, something we never used to see in the Kgatleng. It has raised false hopes. These children are not strong enough for jobs, and too young to go into the brigades where they can get industrial and agricultural training. For instance, one builders' brigade takes in a dozen or more new entrants every year, who also get a week in the month of classroom teaching, mostly arithmetic and English. But building needs strength. Even those who manage to make it to a brigade probably have two or three years of hanging round doing nothing, playing games, drinking when they can, sometimes getting into trouble.

In several courts, including Mochudi, the tribal capital of the Kgatleng, a sort of 'hanging round' is a common sight. There is some recreation, but also classes in simple carpentry, radio and bicycle repair. But they cannot possibly make it in all the drop-outs.

Those who manage to get to secondary school are still young, often looking like 10-year-olds. Time is wasted explaining 'technique' or 'object'. Ten years ago the English of Standard 7 children was distinctly better, both in vocabulary and comprehension. What has gone wrong? Two things, both deplored by most teachers: both African and English, and many education officers. First,

any school entrance has been put at five. One excuse is that expatriates, especially the British, demand school for five-year-olds. I doubt if the increasing number of Scandinavians do, as their children do not normally start so young, and the Swedes at least have to provide a Swedish school when there are 25 children. But Botswana mothers with paying jobs want to get the kids out of the way. There are even nursery schools in Gaborone, the capital, so many urban children may be ready for school at five.

But this just doesn't happen outside Gaborone. In the outlying areas five and six-year-olds are learning at home, helping mother in the lapa, or big brother herding goats, but none of this fits them for school. In addition the syllabus is such that the Standard is 'start off with exercise books and pencils. That means desks, or at best tables. They can no longer be taught under a tree with slates or writing in the sand. They are trapped in classrooms, however little an intelligent teacher may approve.

On top of that there is 'automatic promotion'. Children are moved to the next standard, whether or not they have understood what has been taught. This means that some reach Standard 7 almost untouched by education. If they are under 14 they may be allowed to repeat, perhaps moving up a grade in the examination.

Automatic promotion may make sense in advanced countries, where a big child among little ones can create difficulties. It does not do so in Botswana, where discipline is less important than keeping the children interested enough to stay awake even in hot, sticky weather. Unfortunately much of the curriculum, especially in such subjects as history, is fit only for rote learning, not for interest. Much seems to be geared to great figures in the (European or American) past, who can be of little interest to primary school children.

Most primary schools (except in the capital) have a percentage of uncertificated teachers, or at least teachers with a most inadequate training, who tend to take the lower standards. There are a few Botswana teachers, especially trained for all-tenant work. One school with a roll of 1,070 has six entrants, classes, mostly five-year-olds, and three infant teachers, all much handicapped by lack of equipment. At a recent meeting of the Kgatleng District Council, when there was a discussion on the poor results in Cambridge Certificate (the final school examination, which corresponds to O levels but means probable university entrance), one councillor said: 'Failure in Cambridge begins with Standard 1. How right he was.

That district council passed a resolution asking for primary school entrance to be raised to the age of six to eight. I doubt if the department concerned will pay any attention. It is difficult, when one is fixed in a situation created largely by expatriate 'experts', to back down on it, or to admit that educationally speaking, the country is running before it can walk.

What happens at secondary schools? The first hurdle is Junior Certificate, taken after three years. Many fall by the way; a few duds are weeded out. Those who get first-class passes are almost certainly able to go on for another three years with bursaries; perhaps those with good seconds may. Even a third-class pass means being interviewed for some minor job, a clerkship or something in agriculture (probably non-manual). In some small supervisory category, nursing at some level, or of course the teachers' training colleges.

But even the failures or those who don't get beyond form one may easily find themselves being accepted for a primary teaching certificate course. These youngsters are probably not interested in teaching, especially in the remotest areas, and are often a headache for education secretaries who do the placing. But more and more teachers are needed, according to the pattern of 'progress'—and localization.

Expatriate teachers are useful in secondary schools and, if they have technical skills which they can teach, in brigades. But they cannot help in primaries, and it appears to be Government policy to speed up the building of primary schools in small villages, often with aid from outside countries, but without the teachers to man them.

One immediate difficulty, also found in India, is that children who have been taught African English cannot shift immediately to English or American English, however slowly it is spoken. One asks children if they understand; they answer instinctively with the placating 'yes', but it doesn't mean a thing. The ladder gets narrower and narrower towards the top. This year only a handful from any of the schools, especially those outside the capital, passed the Cambridge Certificate, equivalent to O levels. But all who have completed some 13 years of schooling naturally have high expectations. In Gaborone, where many children are, say, upper-crust civil servants' hear English spoken at home, there are better results. Much of this is a matter of doing an examination in a foreign language, and some ways it is comparable to students having to work in Latin in the European Middle Ages.

What is being examined is memory and not, for instance, a logical way of putting facts together. If pupils can memorize enough they are likely to get through. There is less test of whether the facts memorized can be intelligently applied. Unhappily there is still a great lack of teaching material. Drawing is never to be taught, and when children in JC biology are supposed to draw, say, a plant or a frog, they can't manage it—this in spite of the fact that 'uneducated' tapestry weavers work out for themselves delightful and harmonious pictures in wool. But this inability to draw makes things difficult. If, for instance, a student would like to make a career in surveying or architecture, but needs years of technical training, but needs a passer may simply walk into a local civil service job, depending of course on the tech-

nical experts, but with a higher rate of unemployment. Another awkward thing about education service, which is not confined to Botswana, is over-security, the difficulty of a bad teacher, especially one at the top. There has been the scandal of a Secondary School, an interesting experimental school, incorporating and close contact with brigades. It was taken over by the Government, teachers and pupils united in protest. It was apparently never intended to be a school, but a training college for teachers. A somewhat ruined Swanepoel, fortunately been replaced at the Botswana lady, who seems both capable and tactful, and is mending the situation.

Some blame certainly attaches to Here in Mochudi fathers and mothers came to school at nine. They have a tradition that food matters most. The leave five-year-olds with scarcely brothers or sisters. The children are not cope; they cannot light a lamp, not cope. When a shift system has worked at a school, it has been a friendly place where they will be one solid meal of the day. When they try to put a hard and fast system on this kind of thing, it is a culture still sticks to its ancient patterns of beliefs and prejudices, things are not go badly. But sometimes I feel that capital is not the best place for institutions about the rural areas.

What happens in other African countries? Nearby Zambia started with freemasonry but rapidly realized that it was not to work, except possibly in the capital. The entry age was pushed up two years. In Kenya, town children can go to school and start at five, but the schools and start at five. China, too, has happened in the largest town, the primary. In Nigeria they start at five. African states have no special answer.

It is all a question of flexibility, of being able to change one's mind. In the interest of individuals, the system has been changed. The village, made easier for the village, harder. Education is thought of as the first of children, secondly of the only thirdly of civil servants and the growing pressure from those who will have to effect on the policies and make these strategies rules.

Naomi Mitchison was adopted by the gallas tribe in Botswana, and every year.

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CITY OF BIRMINGHAM

EDUCATION DEPARTMENT
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CITY OF BIRMINGHAM
EDUCATION DEPARTMENT

PRIMARY SCHOOLS
ST. JOSEPH'S R.C. COMBINED SCHOOL
Little Sutton Lane, Sutton Coldfield B75 6PA

Applications are invited for the post of AD TEACHER of this Group 5 school to start on 1st October 1976.

Further details and application forms are available from the Education Officer, Sutton Coldfield, or from the Education Officer, Birmingham, or from the Education Officer, Wolverhampton.

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CITY OF BIRMINGHAM

EDUCATION DEPARTMENT
PRIMARY SCHOOLS

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Primary children with a model suspension bridge they built. (See page 42, "From problem to solution.")

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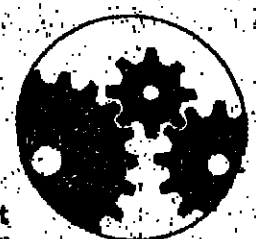
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Preparing the seedcorn

David Bennett describes SCISP—the Schools Council Integrated Science Project

The brief given to the organizers and authors of the Schools Council Integrated Science Project in 1969 was to produce a scheme suitable for the top 20 per cent of the ability range which, of course, includes almost all the future science teachers. It was to be an integrated science scheme—the first for this group—and it was to lead to a special GCE examination with a double certification.

Pupils successfully following it were to be able to progress to work at Advanced level in any science subject. It was to be designed to occupy one-fifth of the school timetable in the three years leading up to O level. Since the three separate subjects had traditionally occupied about one tenth each, the result would be to free one tenth for the introduction of an additional non-science subject—giving an opportunity to broaden the curriculum. Finally the scheme was as far as possible, to draw on the teaching methods, materials and equipment developed by the earlier Nuffield projects.

As it exists at present SCISP fits this blueprint but it has become much more than a limited scheme for a limited group of pupils. It has developed a number of features which are all its own and which make it a unique integrated science curriculum guide. It provides a philosophy and strategy for the do-it-yourself design of programmes for everybody in the secondary school; and in the sample scheme, called "Patterns", it provides an illustration of one way of doing it for the more able pupils. Some of its advanced features are outlined below.

The list of aims reveals four radical intentions. First, the intention to help the pupils to develop intellectual skills which will be particularly useful if their careers are science based. Second, to give priority to this over the teaching of facts. Third, to be concerned with the development and changing of pupils' attitudes to science, to society, and to their own education. Fourth, to encourage the pupils to examine with a critical and sceptical

eye both their own work and that of scientists and technologists in general.

SCISP is the first curriculum development to be based on an explicit model of the learning process. The model is derived from the work of the American educational psychologist R. M. Gagné. According to Gagné's theory the process by which we all learn is hierarchical and begins with the storing of bits of information. Passively or actively these bits are processed into distinct groups. The formation of a concept involves the recognition that the bits of information have something in common. Once formed and labelled with their names our concepts are linked together into complex arrays which we might call patterns. We use our stocks of patterns again and again to solve the problems we are faced with, modifying and extending them each time. Problem-solving represents the top of the Gagné hierarchy—the most sophisticated stage in the learning process.

The learning model is used in two ways in SCISP. It is used to design the programme of work by first choosing the patterns (or generalizations) which the pupils should understand; then deciding on the concepts necessary to build these patterns; and finally choosing activities and experiences which provide the information from which the concepts are built.

It is also used by the pupils. They recognize pattern-finding as the common feature of most of their work and problem-solving as its major motive. The areas in which they search for patterns range freely through the traditional science disciplines to earth science and social sciences.

Project model and patterns inventory

The written material of the scheme is organized into these interacting groups each representing one of the large scale organizing ideas used by all scientists. The three are building blocks (including the idea of a "system"), energy, and interactions. Within this framework, 56 key patterns are isolated. The inventory of key patterns is together with their component concepts is the nearest equivalent to a syllabus in the scheme.

Assessment

Unlike earlier schemes, SCISP has built-in assessment rather than assessment added as an after-

thought. The GCE which includes a teacher assessment is a regular feature of the pupils' internal assessment with the pupils' own judgments with their creative thought.

The SCISP GCE proved to be acceptable on single O-level or following national for National Academic and Guilds, Armed Forces, Civil Service Commission.

Its acceptability for entry to OND and Agriculture, Studies and Public Construction and Engineering (double entry), Technology, Primary Technology (only one subject), Textiles Conference on Science (SCUE) have been that passes in SCISP should be treated as other natural science.

Area System

At present about 15 area coordinators have informed that they are meeting at regular meetings of 15 area coordinators twice a year. They take place on a range of topics covering a range of subjects. They have been used for a far wider range of topics than that envisaged in the scheme. The majority of the ideas of the area group have been used in the design of mode III SCISP.

Books and Sample

The Teacher's Guide to the planning of the project for the design of programmes. One sample programme is presented in the pupils' books. Books and technicians' manuals are published by Longman.



... a Harold-cent

Where are the women?

Geoff Holister comments on their noticeable absence from OU technology courses

At its inception the Open University was probably the subject of more self-indulgent academic fantasizing than any other institution before or since. To the trendy left it was a Harold-cent opportunity to present the venerable dinosaurs with the PhDs they so evidently would have richly deserved had they not been deprived of their birthright by an uncaring capitalist society.

Readers of the right wing press, on the other hand, wrote worried letters to the editor asking what society was going to do with all these "people" when they emerged, like graduate lemmings,



In some circles immaturity can be worn with all the pride of a duelling scar at pre-war Heidelberg.

from the OU production line. Academics smiled knowingly and muttered "more means worse" and other phrases heavy with menace. I had arrived in post, in the spring of 1969, some time after the OU deans, and discovered that the white mice would have no foundation courses in the arts, social sciences, maths and science it was assumed that technologists, those high-class thinkers of the twentieth century, would have no need of a foundation course of their own. After impassioned pleas it was agreed that we could have our foundation course, but that it would have to start a year later than the rest.

We all felt (the few of us in post at that time) that we had something important to say about technology and its effects on society, and that it was particularly important to get this message across to those students who had no intention of specializing in science or technology. After all, one usually finds that all the really important technological developments of this world are taken by people whose knowledge of technology is to put it mildly, non-existent.

What is more, there is a peculiar attitude prevalent in Britain that, while it is expedient to keep quiet about one's ignorance in the arts or social sciences, one can actually obtain a sort of prestige by flaunting one's deficiencies in long division. Indeed, in some circles, immaturity can be worn with all the pride of a duelling scar at pre-war Heidelberg.

High on our list of problems was the strong emphasis on the "women's" problems. It was a message across to those students who had no intention of specializing in science or technology. After all, one usually finds that all the really important technological developments of this world are taken by people whose knowledge of technology is to put it mildly, non-existent.

To no avail we wrote descriptions of our own study guide, assuming that we were not a traditional pro-

Changing objectives

Teaching mixed ability groups. C. George, who teaches chemistry at a Yorkshire school, finds that innovation, like imminent hanging, concentrates the mind wonderfully

Necessarily, every class of more than one pupil is a mixed ability class; all teachers, therefore, develop techniques for dealing with a range of abilities (and aptitudes and interests) within one class. However, deliberately arranging for classes to contain pupils of widely varying ability—as in a non-streamed school—seems to be an emotive decision.

Science teachers, who are almost always skilled in arranging for their pupils to work in pairs or small groups, should certainly be able to adapt their methods to completely non-streamed classes more easily than teachers of many other subjects. They should also be more aware than most teachers of the statistical errors inherent in even the most reliable testing, and the consequent injustices which are bound to arise when assigning pupils to streams or sets.

However, imperfect streaming may be, it does not necessarily follow that non-streaming is preferable; indeed, some of the techniques advocated for non-streamed classes might be even more effective with streamed groups.

It may be the philosophy of non-streaming rather than its practicalities which is the main problem. The increasing emphasis being given to the non-academic functions of schooling demands many teachers. Instead of being allowed to teach their subjects to the best of their ability, providing for all pupils those materials and approaches they judge to be most suitable, they are required to put a great effort into changing their well tried techniques, so that the internal structure of the school can be changed, in pursuit of what may seem to be vague sociological ideals. In the new situation, the teacher is likely to find that restricted, subject-based didacticism is of declining importance.

Thus the trend towards non-streaming evident in many parts of the country may reflect a change in the function which society expects its schools to fulfill; alternatively, as a possible means of

dealing with discipline problems and "sink" forms, it could be the last desperate attempt to survive by a type of institution now in its death throes. Whatever the causes of the change, the innovation concentrates teachers' minds on objectives and methods.

The objectives of science teaching have been changing in recent years quite independently of changes in class organization; this development can be followed through the many science curriculum projects which have been published. The trend has been away from the acquisition of a body of knowledge, and towards more subtle aims—developing scientific ways of thinking and observing, and promoting an awareness of the applications and consequences of science.

A declining requirement for factual knowledge might seem to be to the advantage of the teacher of a non-streamed class; but the development of thinking processes is certainly no easy option, and the level at which this can be done will vary greatly from one pupil to another within such a class. Providing equal opportunities for pupils does not imply that they have equal needs.

Changing objectives have been accompanied by changing methods, and developing ideas about authority and control have been reflected by changes in the teachers' role in schools. Teacher-based systems of instruction are giving way to resource-based systems of learning, although the teacher always remains one of the available resources.

One of the widest such changes is the move towards successful work with non-streamed classes, because they more easily allow some degree of efficient individual and small group working. Preparation of resources, however, takes a great deal of time, and many teachers are concerned about whether they can plan and prepare sufficiently, while maintaining their professional standards of record keeping and correcting pupils' work. Increased cooperation among the staff within a science department (which is often mentioned as an unexpected bonus arising from the change to non-streamed classes), and between schools, can help to reduce this problem.

Increased use of resource-based systems makes increased demands on the pupils. A small number of poor readers can be carried by a

ffective colouration ("say something rude about Skinner and Eysenck—quote McLuhan") and merged. I never saw him again.

Now that the summer school period is over I hope in vain for those hundreds of female T100 students whom I know now will never appear. Still, as T100 comes to the end of its working life, to be replaced in a few years by T101, I wonder whether next time we can pull it off. But I fear that once more we shall be fooled by our handy-handed image. I wonder if a whole course team could write under a pseudonym?

One thing you can be absolutely sure of—when T101 finally hits the presses it will not have the word Technology in its title!

G. S. Holister is Professor of Engineering Science at the Open University, and was the first Dean of Technology.



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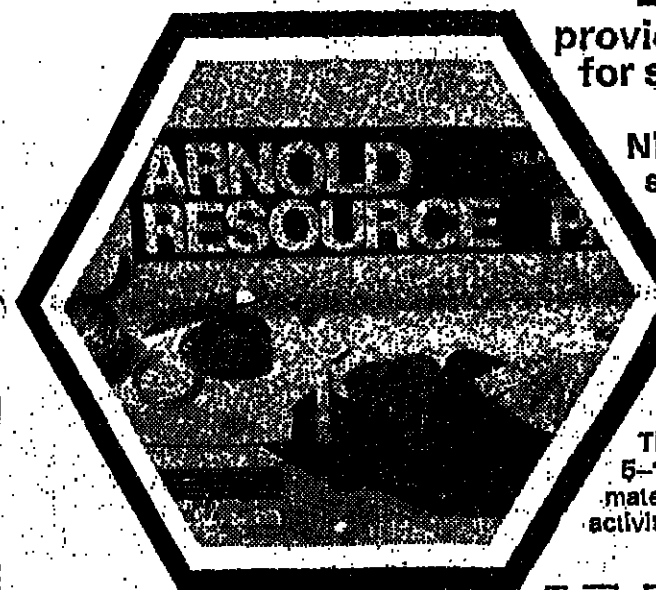
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An introduction to applied science

Dr. G. C. Sneed explains the purpose of "School science and everyday life", a travelling exhibition financed by the Department of Industry on behalf of PETT (Project: Engineers and Technologists for Tomorrow). It consists of 12 models showing how physical principles taught in school are used to solve technological problems in the world outside

It is not unusual for boys and girls in secondary schools to ask questions such as "Why am I being taught this?" and, in the case of science, "How does that help me?" Such questions are sometimes difficult for a teacher to answer as young people generally require to be convinced within a few minutes.

The growing tendency for manufacturers to produce sealed units is harder even for the most observant and intelligent to see how science is applied to solve some of the technical problems encountered in normal homes and everyday surroundings. Examples of applied science, such as great airliners or oil rigs, that reach the television screens and popular press are so complex that it is impossible for young people to link, unaided, any scientific principle taught in school with the hard-ware shown. It may well appear to them that there are two kinds of science, school syllabus science and some other "useful" science that engineers learn somewhere and apply to build the machines that provide our energy, comfortable travel and the labour saving devices that fill the shops.

In 1968 Prince Philip's Action Committee on Applied Science was instrumental in setting up the School Technology Programme, within the University of Surrey, financed by a three-year grant from the Shell Petroleum Ltd. The author, who was invited to become the director of this research unit, was asked to devise an approach and supporting material that would help science teachers—without any special facilities—to introduce their classes to applied science as an activity to begin to eliminate the problem outlined above.

The approach developed involved linking the principles taught in school syllabus physics at O and A level, with genuine industrial or medical problems and their solutions. The approach was designed to find interesting problems/solutions that could be comprehended and which had been solved largely by the application of a single principle.

In this way a teacher could present a topic in the conventional manner and then show, with words and pictures, its value outside the classroom; or the other way round. This approach need not occupy more than 10 minutes of a science lesson, but continued over a term or so enables the students to acquire a little more appreciation of the applied aspect of science.

In addition to printed material, giving many detailed examples of the linkages, the School Technology

Programme designed and built a number of working models that showed how a single physical principle was solving an industrial problem. Wherever possible the models incorporated genuine components. In response to a recent request from the Department of Industry 12 of these models have been selected, improved by the author, and rebuilt for press button operation. All the construction work was carried out in the Electrical Engineering Department of Imperial College, London. These 12 models together with individual display stands, lighting, and appropriate artwork form the new travelling exhibition "School Science and Everyday Life".

Visitors to the exhibition can, for example, see how electrical energy from a heart pacemaker power supply mounted outside the body is conveyed to the heart by the need for a wire passing through the skin (Fig 1). It is easy to appreciate that a wire sticking out of the body would be uncomfortable and easily broken, and so young visitors gradually comprehend the value of applied science and the ingenuity of the people involved.

Teachers will find that exhibits of this kind can be used either to interest boys and girls of 11 or 12, or to demonstrate to older students an application of a specific principle; in the case of the heart pacemaker it is mutual induction. Other models in the exhibition show how the level of a liquid such as liquid oxygen can be detected by rays of light instead of a float, how a premature baby automatically warns nurses when it stops breathing for a few seconds, and how the accuracy of a musical note can be checked by the eyes instead of the ears. Two models dealing with measuring the RPM of a motor and a fluidic lung ventilator respectively, are provided with recorded descriptions as visitors seem more willing to give their attention to slightly longer explanations (30 seconds) if they are spoken rather than printed.

At present the exhibition is made available through the SATRO's and arrives at the nominated site, on DOE transport, in wooden crates. A trolley is supplied to help move the crates to the display area. Full instructions for assembling and dismantling are provided in advance and experience has shown that the assembly of the stands can be completed by two men within two or three hours.

Prospective borrowers should contact their local SATRO's or in the case of difficulty, The Secretary of PETT, Department of Industry, Abell House (Room 114), John Islip Street, London, SW1.

Studying science by touch and ear

An Edinburgh course for the blind and partially sighted. By Lynne Gladstone-Millar

Education through science, rather than education in science, this is how science teacher Colin Weatherley describes the work he is doing at the Royal Blind School, Edinburgh, where he is developing a course suitable for the pupils at the school.

"Science is almost subordinate to the main aims of the course", he says. "It is a means to an end. I feel that all our lives are so dominated by science, and particularly technology, that aspects of science are being lost. It is a course using science to help the kids have to understand themselves and their involvement."

On this basis, he selects the material for the course. "In a lot of the courses in modern science, the criteria for selection are: is it a course for interesting scientists? Our course is not; it is science for the general citizen."

Colin Weatherley, an Oxford graduate, came to this particular job in a roundabout way. In formal terms, he is an education research fellow attached to the school, and he has now done two years of the three years of the attachment. He first came on secondment from the Scottish Schools Science Equipment Research Centre in Edinburgh, after a plea for help from the examination board. "They had problems with

some of the totally blind children taking the O grades in biology and anatomy, physiology and health."

The first thing Mr Weatherley did was to have made polystyrene raised plastic diagrams for the children to work with. He also started to adapt part of the biology syllabus so that the blind children could cover it. When he was actually working with the children, however, he realised that these O level pupils were at a level of understanding that was far beyond what he could teach. "There might be at the very most six kids in the senior school who would go to O level and need this O level—less than 10 per cent."

It seemed a bit ridiculous to be spending one's full-time efforts on a course for a very small minority of the school. "I was convinced that this was not a valid way of using my time," Mr Weatherley started to devise a course from scratch for the majority group of children; some of whom are totally blind, some partially blind and some with multiple handicaps. "It is a course using science, rather than a course in science."

In the first year, it was really a many type science—free activities. There was no attempt to build up any of the concepts. He felt that

any children, not just the handicapped ones, He deliberately set about encouraging exploration.

"Our talk was temporarily halted by the arrival of a class at the lab door. Confidently the children fetched their equipment, their Braille machines, tape recorders, and box files with their names in Braille on the spine."

Sylvia and Gail were working on projects on the heart and they began to listen to tapes on heart diseases, their causes, and so on. David, virtually totally blind, had made a graph on smoking habits in this country, using a peg board, and elastic bands for the lines. He had, he told me, approached the

Continued on opposite page

Mutual induction

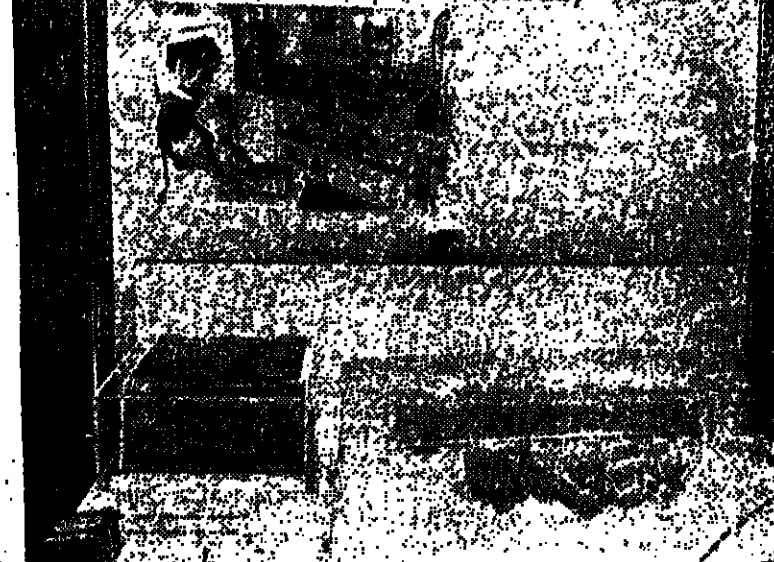
Conveying electric pulses to the heart



Fig 1. How electrical energy is conveyed to the heart from a heart pacemaker power supply. Fig. 2, below, shows an automatic warning system that warns nurses if a baby stops breathing for a few seconds.

Electrical resistance changes with temperature

Science assists a premature baby



Schools technology centre

Its uses and aims. By G. B. Harrison, director

The National Centre for School Technology was established in 1972 by Trent Polytechnic, Nottingham. This was done in response to feelers from the Schools Council, its project technology team and consultative committee, and newly formed Standing Conference on School Science and Technology and from its associated body, the School Technology Forum.

All the bodies recognized that, although there were all sorts of resources and support for teachers generally, there was still a great deal to be done. Not least was the need for new approaches in teacher training, a new look at examinations, and perhaps of even greater importance, a major study of the ways in which schools respond, or might respond, to national economic needs in terms of manpower education and supply.

NCST is now part of a growing team of people and organizations committed to improving the effectiveness with which the educational service helps to prepare children for their active roles in a technological society.

The centre has two approaches to teacher training. First, it runs its own in-service courses for teachers and stimulates and assists I.E.A.s, colleges and schools of education to run courses of many kinds. Its own short courses are large and designed to make teachers and advisers better equipped to run courses and provide advisory services in their own areas. This "breeding" of technology teachers is clearly more economic than attempting to provide courses for all interested practising teachers. Summer schools for practising teachers are run with the DES (last July at Loughborough, next July at NCST, Trent Polytechnic).

A new and far-reaching development has been the DES approval and is now awaiting CNA A validation; it is a course, leading to a CNA A BEd degree, specifically for practising teachers who wish to make their teaching more technological. It is hoped to start this course in the next academic year and more details will be published as they become available.

Staff are also often asked to help run courses for teachers in different parts of the country including initial training, postgraduate, induction and in-service courses. While NCST is pleased to meet such requests when staff, time and material resources permit, it generally feels that its teacher training resources are better spent on "breeding" aspects of teacher training.

Its second approach to teacher training, NCST works closely with the School Technology Forum on behalf of the Standing Conference on School Science and Technology. Incidentally, SCSST commissions

Trent Polytechnic to provide the secretarial services of this and similar activities which support the forum. The forum, following last year's highly productive national seminar and conference on teacher training for technology, has established a series of working parties dealing with initial training of teachers, in-service training, research and recruitment. Each of these consists of teachers and lecturers from all Britain and is serviced by NCST. A number of publications and courses are being developed.

NCST provides an even more direct service to the practising teachers than in-service courses. It is putting a lot of effort into preparing publications and equipment for use in the science laboratory and in the workshop. Two books are now published under the NCST Trent Polytechnic imprint: *Op Amp Applications* by Malcolm Plant, a practical guide to the use of operational amplifiers integrated circuits in a multitude of scientific and design situations, and *Photostability for Schools and Colleges* by D. G. Wilson and G. L. Stockdale.

A new publication is the *Directory of Resource Material for Teachers of Technology in Schools*.

Following some of the developments of project technology, NCST has worked to ensure that the equipment needs of those schools tackling technological activities are met, bearing in mind all the practical economic realities. Recent developments have been the marketeering of NCST for all interested extruded aluminium adaptable project construction system and of the 10 volt, 2 amp stabilised power pack kits designed at NCST.

Sales of all these books and equipment are justification of the principle that the educational service can and should use its own resources to generate further resources rather than assume that commercial suppliers will automatically meet all needs.

Perhaps the most important of the centre's publications is its quarterly publication *School Technology*. This journal, written by teachers of the various types of school technology, provides an exchange of information and ideas. The latest issue, September 1975, in addition to enclosing an index to all previous issues, includes articles on aids for children suffering from spina bifida, industrial links with schools, projects on sails and on h-i-d detailed information on available resources.

Running parallel with the equipment and publication developments is a continuous hot-line information service for teachers who make direct contact with the centre. Technical information, educational and curriculum information and ideas are all requested and provided, usually

successfully if the number of such callers who come again for help are anything to go by. This service also seems to be meeting overseas needs as there are many countries now developing school activities along the lines of project technology.

All these practical developments, teacher training, publications, equipment and the advisory service, have to make the assumption that the basic principles and directions are the right ones. What would be wrong would be in assume that such principles and directions are absolute and unchangeable. A major concern of NCST is, therefore, to study fundamental needs, as seen by schools, examiners, employers, further and higher education and by the engineering professions, and to attempt to match these views to each other.

For example, Trent Polytechnic accepts a responsibility to help schools to develop sixth-form courses which will not be constrained by the traditional academic requirements of universities but will both help schools to develop and achieve recognition for a broader range of types of ability at age 18 plus and help higher education to meet its own responsibilities to provide a wider range of courses which will develop knowledge and skills to meet real social purposes.

An instance of how this responsibility is being met is the acceptance of a commission from the Schools Council to make a study of the feasibility of an N (and 2) level examination in design which will have no specific knowledge based syllabus but will concentrate, by the use and assessment of project work, on the skills and attitudes needed by the scientist, the engineer, the designer, the town planner and others, to help them in their creative problem-solving activities.

NCST sees itself as part of what is at last beginning to cohere as a national movement which recognizes that the technological nature of the world's economic and social structure requires technological elements in our school curriculum. It realizes, however, that it is not a simple matter of the short-term meeting of a well-defined need so much as a series of successive approximations each of which is defined by one or more national interests.

Now that the inertia of the education system is becoming shattered it is of the utmost importance that evolution can be encouraged and that the science, technology and the humanities become more convinced that technological flavours, topics and objectives can help them to achieve their own specific aims. If they find themselves applying technological design needs to their stated aims, more to the good.

Continued from opposite page

health clinics in Edinburgh to get information on the statistics. Mrs Moira Cowie, an English teacher, had passed in a lesson on *Macbeth* to come to the lab to draw the graph for David so that it would be put in the thermoform machine. Other children were working on tapes dealing with drugs, smoking and cancer, and electricity. Mr Weatherley walked round the lab with a hand-set on, plugging into the various tape recorders on the tables and talking about the material to the children.

"Remember," he told the class at the end of the lesson, "the social aspects of biology, drugs, alcohol, heart disease, and so on. But we are using science to help you to understand all the causes of these things, and in your projects you are to have a scientific background."

In dealing this course, Mr Weatherley has not forgotten the fact that 10 per cent of the children at the school may need a science qualification to go to university, and the course is designed so they can take A-level CSE through the Northern Regional Board in Newcastle.

"It has school-based assessment," he explained, "and the school can choose its own course. The board send a moderator who discusses the results, and standardizes the results. A Grade 1 CSE is regarded as an O level pass, and the university will accept this."

As well as making the course more suitable for blind children, Mr Weatherley has instituted

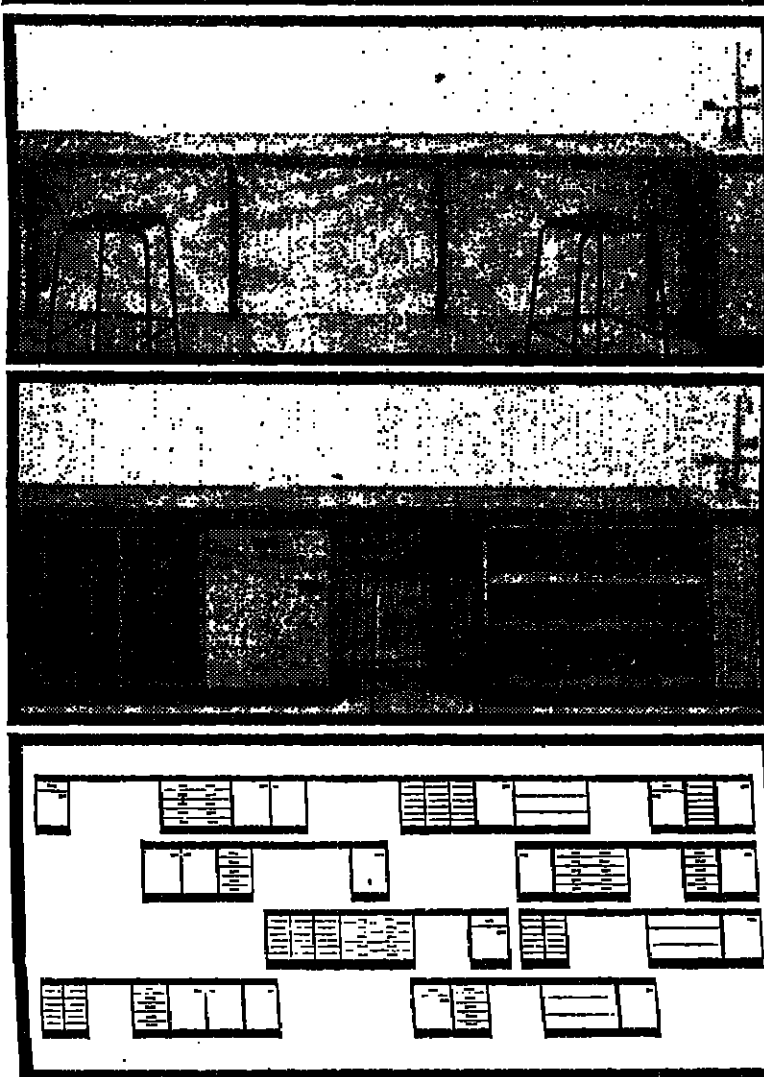
another valuable dimension. He has got under way an imaginative scheme whereby children from Firrhill High School in Edinburgh come over to the Royal Blind School in their minibuses and share the course. "The kids here are bored, and to a large extent cut off from other people during the term. We wanted to try to get them out and mixing with other kids."

There was also another reason for this link-up. When Mr Weatherley leaves at the end of this year he hopes that a lot of the teaching will be carried on by staff from Firrhill, either at the Royal Blind School or at Firrhill. This was thought a better scheme than appointing one person full-time at the Blind School. "The Firrhill children are paired off with the children at the Royal Blind School. I wondered if they were shy of the handicaps of the other children."

"Not a bit. I am very impressed with them, particularly the girls. Yes, they have the wit not to patronize. Most of our kids who are involved don't need patronizing anyway. They are pretty normal kids, most of them."

Entered if a joint course like this was run anywhere else, but Mr Weatherley did not know of another one in Britain. In the Sheffield area some promising blind primary children were given intensive training to enable them to go to the Leeds Technical College. This said, Mr Weatherley is the ideal approach, but in the case of the Edinburgh school, the problem was too urgent for a long-term project like that.

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Longman

Electronic systems: a pilot A level from Essex

By G. B. B. Chaplin, Professor of Electrical Engineering Science and head of syllabus development team

During the past 20 years or so electronics has developed from a specialist military technology to become the basis of communication media found in almost every house, hotel, and, more recently, to provide increasingly pervasive every aspect of our lives.

The dramatic change in both the capability and availability of electronic systems can be seen in the transition from the early giant computers to today's microelectronic machines. The first generation of computers filled large rooms from floor to ceiling, dissipated many kilowatts of power and cost around £1m.

Computers of similar capacity today consist of a handful of integrated circuit packages, smaller than one's finger-nail, dissipating only a few hundred pounds. Because of their incredibly small size, high reliability and low cost these microcomputers are being regarded not only as component parts, or subsystems, of larger systems, such as the controllers of telephone exchanges, or of complex chemical plants, and it will not be long now before they become commonplace in the home.

The virtually unlimited breadth of systems which these electronic integrated functions have made possible has transformed electronics into a subject of high academic merit while still retaining the intriguing practical applications which give interest and high motivation to its study. A subject as broad as this could not be constrained within the limits of an A level syllabus unless it were possible to break it down into a number of fundamental principles.

Not only can this be done but, as in any system, no matter how complex, it can be shown that only three basic principles are involved, i.e.

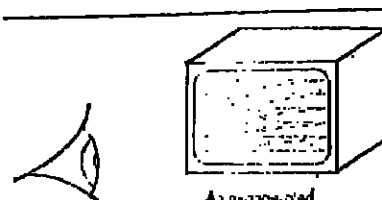


Figure 1. A spot of light tracing out the path shown on a TV screen is perceived by the human eye as a steady picture.

communication, feedback (positive and negative), and computation (decision making and memory). The syllabus devised at Essex is, therefore, divided into three main sections: communication systems, feedback systems, and computer systems. Each of these three main sections is chosen which illustrates the various aspects of the principle in terms of everyday experience.

It will be noticed that the three sections are labelled systems rather than principles. It is felt undesirable to teach the fundamental principles in the abstract, and so they are taught in the context of a system in which that particular principle predominates. Thus communications is taught largely in the context of that which is involved in communicating a visual and audible scene from a television studio into a living room.

Clearly, the use of an electromagnetic wave to convey energy from the transmitting aerial to the receiving aerial, and the modulation of the wave with the relevant visual and audible information is a well defined communication principle, but the translation of the studio scene into an electronic waveform from the TV camera and the re-translation back into a visual picture by the TV receiver includes

some elements of computation and feedback. Nevertheless, the entire communication link is more real and understandable and thought-provoking than would be isolated elements of it.

The syllabus includes a short section on basic electronics which provides sufficient understanding to enable the systems experiments to be implemented.

A further feature of this syllabus is its emphasis on man as the focal point of man-made systems. Systems designed for the use of man should, but do not necessarily, take sufficient account of man's relevant physical and mental characteristics. Each of the three main sections, therefore, begins with a discussion of the human characteristics relevant to that section.

For example, the communications section discusses those properties of the eye and brain which result in the perception of motion and colour. These properties allow a rapidly moving spot of light to produce the illusion of a complete picture (Fig. 1), and three primary colours to produce the complete colour spectrum. Furthermore, a quantitative knowledge of these visual characteristics, including the resolution of the eye, allows the man-made communication system to operate at a minimum of "bandwidth" and hence at minimum cost.

The feedback systems section of the course begins by considering the fundamental elements of a negative feedback system. Fig. 2 shows such a system, containing a stage for comparing the actual state of a system with the desired state, the difference between the two being an error signal which the system attempts to reduce to zero.

In an ideal negative feedback system, not only should the actual output state equal the desired output state when in equilibrium, but the actual output should be able to follow faithfully rapid changes of the desired output. In practice, factors such as delay in detecting the error signal, and the time taken for the system to respond to the error signal, cause the system to oscillate, and the error signal to be a damped oscillation.

The human being is a prolific source of feedback systems, and the human aspects section considers both involuntary and voluntary systems within the human body, and then considers man as a component in a larger feedback system. Involuntary control systems within the human body include such phenomena as the change of heart rate due to physical exertion, or the reduction in the aperture of the iris of the eye with a rapid increase of ambient illumination.

Voluntary systems are those under conscious control, where a human is performing some task such as inserting a key in a lock (Fig. 3). In this system, the error signal is the difference between the position which the eye perceives, and the position which the brain is demanding. Due to inertia in the arm and delays in the neural pathways, the key does not reach the lock in a straight line, but performs a damped oscillation as shown.

Examples of man as a component part of an internal feedback system include riding a bicycle, driving a

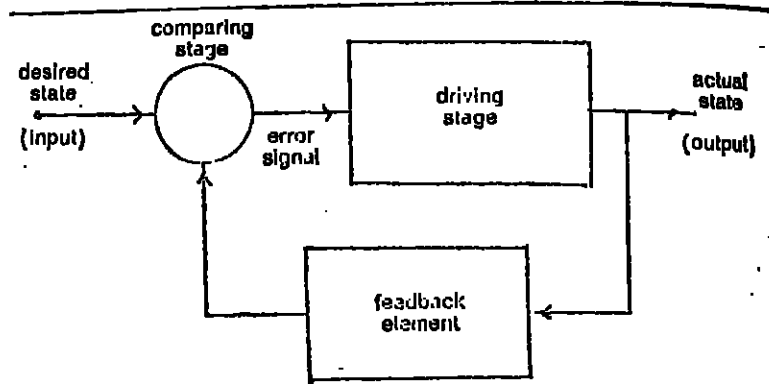


Figure 2. A basic negative feedback system. The actual output is compared with the desired output (i.e. input), the difference being an error signal which the system automatically tries to reduce to zero.

by a team from the electrical engineering department of Essex University in conjunction with the Colchester Royal Grammar School, where six pupils sat the first A level examination in June, 1974, with encouraging results. Under the three-year pilot scheme allowed by the Schools Council a further eight schools with a wide national distribution started the course in September, 1974.

The reactions of the 14 teachers taking part have been favourable, and there appears to be a common agreement that the course is both intellectually stimulating and highly motivating. This latter point was among those emphasized by Mr G. F. Beavis, of Richard Taunton College, Southampton, at a symposium on "Electronics in Education" at Queen Mary College.

He posed the question: "Why is electronics, and in particular this new pilot A level in Electronic Systems, so interesting?" and went on to answer, in part: "Electronics is highly relevant to the modern world with electronics in one form or another. Also students, enjoy getting involved with electronics; they develop more self-confidence as they are able to do things for themselves. As a result, they become more motivated and interested in what they do, and because of their enthusiasm this course becomes enjoyable to teach."

The syllabus is currently being offered by the AEB to a maximum of 10 centres for a three-year trial period as allowed by Schools Council. As a result of the experience of those teachers taking part in the pilot scheme, and the number of inquiries received from other schools, it is intended to re-submit the syllabus to the Schools Council, asking for permission for it to be asked generally available in time for other schools and colleges to start teaching the course in September, 1976.

A half day conference on this syllabus, during which teachers (taking part in the scheme) will be held at the City University today. The opening speaker is Sir Iwan Maddock, chief scientist of the Department of Industry. A report of the conference will be reported in the conference secretary, Mr D. Dibbald, telephone 01-211 5882.

lytically about certain types of numerical and verbal relationships together with skill in visualizing spatial configurations in two or three dimensions appear to be prerequisites for success in science. So whether many more pupils can be expected to eventually fill those empty places in university science departments seems, on the face of it, very doubtful.

Donald Hutchings is at the University of Oxford Department of Educational Studies.

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How far certain school subjects are more intellectually demanding than others is still an open question. Tests only measure cognitive and personality variables. It could be argued that most intelligence tests used in schools are essentially tests of scientific thinking.

What does seem clear, however, is that certain school subjects are preferred by pupils who do well in science tests and rejected by those who do badly. Ability to think ana-

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PRIMARY continued from page 40

Remedial Posts

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HUNTINGDON C.P. SCHOOL, Huntingdon, Cambs.
REMEDIAL TEACHER for the remedial centre, Huntingdon. The post is for a full-time position, to be filled by a qualified teacher with experience in remedial work. Salary £10,000 p.a. plus pension. Applications to the Headmaster at the school, Huntingdon, Cambs., by 20th October, 1975.

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DERBY AND SOUTH DERBYSHIRE
HAYWOOD INFANTS SCHOOL, Derby
REMEDIAL TEACHER for the remedial centre, Haywood. The post is for a full-time position, to be filled by a qualified teacher with experience in remedial work. Salary £10,000 p.a. plus pension. Applications to the Headmaster at the school, Haywood, Derby, by 20th October, 1975.

Scale 1 Posts

AVON COUNTY JUNIOR

MILTON COUNTY JUNIOR
MILTON C.P. SCHOOL, Weston-Super-Mare, Somerset
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PRIMARY continued from page 40

Remedial Posts

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PRIMARY continued from page 40

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ST. BENEDICT B.C. (A/D/19)

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the school con-
struction, to which
the school forms are
being added.

FORDSHIRE
CITY COUNCIL
BANS DIVISION
POD PARK SCHOOL
Lancaster
(Area 10)
Inspected January
CERTAIN
full but last session
developed June-July
well school by ac-
quaint French and
August " " U.S.A.
" " " " " " " "
signature Laboratory
reference £141 per
the Foundation
committee refer

been established
the person appointed
has a large
library.
The school and
headmaster.
The new year
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may be carried
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may be made

KIRKLEES
MILLION COUNCIL
STAINTS, N.C.
RENTSIVE S.HOOD
NORTH BRADFIELD
HOD 207
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191-28 years.

For January,
RENTSIVE S.HOOD
NORTH BRADFIELD,
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UNION COLLEGE, New York, N. Y., has a position for a male, M. A. S. in English, to teach English and Spanish at various levels. He should have a minimum of 3 years' experience and be able to teach Spanish. Salary commensurate with experience and ability. Send resume and references to: Mr. H. J. Wagoner, Director of Personnel, Union College, Schenectady, N. Y. 12308.

COURT SCHOOL
Macquay, Telford
Single, 1, in 11
positions designed
for those who
to form and further
the Headmaster.

C. L. H. SCHOOL
In Borough of
Developing urban
in modern well
with a "out Centre
for Adult Education
for January 195
for CHAIRMAN
Our Ministry
out is available
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Park Road, W
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NY COMMITTEE
OYS' GRAMMAR
BY 1 1RZ
January, FRENCH
in 1955 temporary
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qualified applicants
details from French
addressed envelope

In almost any country you care to mention, The Times Literary Supplement finds a place in senior common room, on writing desk, in a briefcase. For academic and layman alike, the TLS provides voyages of discovery into every conceivable subject. Some of the finest talents write regularly for the Literary Supplement, and almost half a million lively minds read it every week.

**THE
TIMES
LITERARY
SUPPLEMENT**

126

CITY OF COVENTRY

London Court Mixed Comprehensive School
Northbrook Road (1580 on roll)
OME ECONOMICS—modern purpose-built rooms, wide-var-

Linham Park Mixed Comprehensive School
Green Lane (1400 on roll, 80 in Lower Sixth)

1) Master to teach mainly **METALWORK**—Scale 2 available
suitably qualified and experienced candidate but new
unfilled candidate welcome to apply

2) Second in **ENGLISH** department—Scale 3. Suite of room
and Theatre Workshop, 'O' level and C.S.E. courses w
established and 25 'A' level candidates.

Boxford Mixed Comprehensive School

OYS' CRAFT—Metalwork and Design.

1) GEOGRAPHY—Scale 2 to be second in department and have an active interest in field work. 'A' level work is available.

2) PHYSICAL EDUCATION—Interest in games, swimming and gym is preferred.

the Woodlands Boys' Comprehensive School
Wood Lane (1690 on rail)
ISTORY
required as soon as possible CRAFT teacher—Woodwork
metalwork.

Apply by letter giving full details (age, qualifications, experience), with names and addresses of two educational referees to the Head Teacher of the School concerned, unless otherwise stated.

SHIRE COMMITTEE

addressed foolscap envelope to
1, County Hall, Preston, PR1 8RJ
- as stated

BURNLEY IVY BANK HIGH (Co-educational 11 to 16; 1,180 net
roll)
- required, 1st January, 1978 -
- for recruitment (first four applicants will be recommended)
- REHABILITATION WORK, interest in disadvantaged and maladjusted
- children, Scale 2 (for applicant with suitable experience,
- District Education Officer, Education Officer, 14, Nelson Street,
- Burnley, Lancashire BB10 1JH)

SCALE 1 POSTS

GREENWOOD CARINALE ALLEN R.C. SECONDARY (Arlene) (750
mbcd)
New 1st January 1976 due to expansion —
TELEPHONISTS (availability of work to C.S.E. and G.C.E.)
comes from the Head at the school, Broadway, Greenwood.

PROBATION PARKLANDS HIGH 11 to 16 comprehensive mixed
GENERAL SUBJECTS including English and Mathematics.
Reopened January 1976 —
New 1st January 1976 due to the Headmaster, Dreapale Building,
St. Stephen's Road, Preston PR1 6TD.

CLYDEDALE, 20th October, 1975.

LYNDALD, WELLSFIELD HIGH (780 mbcd comprehensive)

FORMS FROM: Acting Headmaster, Yewlands Drive, Egham, Weston,
 P35 1TP.
 BORNHURST, GRAMMAR (51 pupils; mixed);
 1976-1977: 1976-1977: 1976-1977: 1976-1977:
 DISTRESS FOR GIRLS' PHYSICAL EDUCATION, SECOND IN-
 FORMATION returned as soon as possible, and further details
 stamped addressed envelope from the Head at the school, Ruff
 Lane, Blackburn.
 BLACKBURN, BILLING: HIGH (1,150 mixed, comprehensive)
 Reported last January, 1976:
 FORMS FOR MATHEMATICS in join. a. boys and girls' department,
 1976-1977: 1976-1977: 1976-1977: 1976-1977:
 Further details from the Head at the school, Blackburn.

AACRINGTON, THE HOLLINS COUNTY HIGH 1956 on road
to "BOYS' CRAFTS," mainly woodwork. Some building exist-
ing for "GIRLS' PHYSICAL EDUCATION/GAMES."
Closing date: 20th October, 1975.
BURNLEY, ST. JAMES' HOUSE, St. James' Street, Accrington,
Lancashire. Closing date: 20th October, 1975.

BURNLEY, IVY BANK HIGH (Co-ed) questions 11 to 16; 1.180 on
roll
Closed, January 1976:
No "GIRLS' PHYSICAL EDUCATION" Ability to assist with Girls' Games useful, but
not essential.
No "BOYS' CRAFTS." (Plans and footpath alarmed addressed "envelopes")
The District Education Officer, Education Officers, 14 Nicholas Street,
Burnley BB1 1AW, by the 20th October, 1975.

For primary or Junior High School
or NEEDLEWORK - Help with LIGHT CRAFTS an advantage.
New buildings with girls craft complex 1973.
Forms/detail from/to the Hand at the school, Venables Avenue,
Clyne B18 7DP. Colne S200.

THE UNIVERSITY OF SHEFFIELD LIBRARY

1. *Journal of the American Medical Association*, 1997; 278: 1039-1044.

Lothian

Regional Council

DEPARTMENT OF EDUCATION

TEACHING APPOINTMENTS

Applications are invited from registered teachers for the following posts:-

EAST LOTHIAN DIVISION

SECONDARY

Assistant Principal Teacher

MUSKELBURGH GRAMMAR SCHOOL, Science

Teaching Post

PRESTON LODGE HIGH SCHOOL, Biology

EDINBURGH DIVISION

SECONDARY

Principal Teachers

FORRESTER HIGH SCHOOL, Technical Education

Assistant Principal Teachers

TRINITY ACADEMY, Science

Assistant Housemaster

GRACEMOUNT HIGH SCHOOL

Teaching Posts

FIRRHILL HIGH SCHOOL, Science (Physics/Maths)

GRACEMOUNT HIGH SCHOOL, Technical Education

PORTERFIELD HIGH SCHOOL, Chemistry

MIDLOTHIAN DIVISION

NURSERY

Teaching Posts

EASTFIELD NURSERY SCHOOL, Primary

WOODBURN NURSERY SCHOOL, Primary

For the above posts will be given to applicants with a nursery qualification.

WEST LOTHIAN DIVISION

PRIMARY

Head Teacher

BROXBURN PRIMARY SCHOOL

SECONDARY

Principal Teacher

BATHGATE ACADEMY, Technical Education

Assistant Principal Teacher

GRANSHILL HIGH SCHOOL, Physical Education

Teaching Post

Teacher/Naturalist

The person appointed will act as a tutor for staff and pupils mainly in the primary sector and assist in the development of the environmental aspects of outdoor education. Experience in this field is essential and an appropriate qualification would be an advantage.

Housing may be available and further information can be obtained on application to the Divisional Education Officer, West Lothian.

Salaries in accordance with the provisions of the Remuneration of Teachers (Scotland) Act, 1967, as amended.

Candidates should specify for which post they wish to apply.

Application forms are available from the appropriate Divisional Education Officer at the following addresses:-

East Lothian Division—County Buildings, Court Street, Haddington.

Edinburgh Division—44 Torphichen Street, Edinburgh EH3 5JZ.

Midlothian Division—44 Torphichen Street, Edinburgh EH3 5JZ.

West Lothian Division—80/81 High Street, Linlithgow.

The closing date for applications is 24 October.

SPECIAL EDUCATIONAL SERVICES

Applications are invited for the following posts:-

Educational Psychologist or Senior Psychologist

Applications are invited from the East Lothian Division. Candidates must be registered with the British Psychological Society and have a minimum of five years' experience in the field of educational psychology. A postgraduate qualification in educational psychology would be an advantage.

Application forms are available from the appropriate Divisional Education Officer at the following addresses:-

East Lothian Division—County Buildings, Court Street, Haddington.

Edinburgh Division—44 Torphichen Street, Edinburgh EH3 5JZ.

Midlothian Division—44 Torphichen Street, Edinburgh EH3 5JZ.

West Lothian Division—80/81 High Street, Linlithgow.

The closing date for applications is 24 October.

Assistant Adviser, Primary Remedial

Applications are invited from the West Lothian and Midlothian Divisions. Candidates must be registered with the British Psychological Society and have a minimum of five years' experience in the field of primary remedial work. A postgraduate qualification in primary remedial work would be an advantage.

Application forms are available from the appropriate Divisional Education Officer at the following addresses:-

West Lothian Division—80/81 High Street, Linlithgow.

Midlothian Division—44 Torphichen Street, Edinburgh EH3 5JZ.

The closing date for applications is 24 October.

Junior (Sixth Form) Colleges

Heads of Department

SOLIHULL

Metropolitan Borough of Solihull, Warwickshire

The college opened in September, 1974, and is a day school for boys aged 11 to 18.

The college is a day school for boys aged 11 to 18.

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Deputy Headships

Senior Masters

Mistresses

AVON COUNTY

Avon County Council, Gloucestershire

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DEPUTY HEADSHIP

Senior Masters

Mistresses

AVON COUNTY

Avon County Council, Gloucestershire

The county opened in September, 1974, and is a day school for boys aged 11 to 18.

The county is a day school for boys aged 11 to 18.

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EDUCATION DEPARTMENT

Senior Careers Officer

AP4/5 (£3,627-£4,356 inclusive)

This post will be particularly concerned with college students, sixth form pupils in comprehensive schools and pupils in selective schools.

Applicants should have a minimum of two years' previous experience as Careers Officers.

Further details and application forms are obtainable from J. E. Fordham, B.A., Chief Education Officer, Education Office, 255-9 High Road, Ilford, Essex IG1 1NN. Closing date: 24th October, 1975.

Redbridge
London Borough

METROPOLITAN BOROUGH OF SANDWELL

WEST BROMWICH COLLEGE OF COMMERCE AND TECHNOLOGY

ACADEMIC REGISTRAR

Applications are invited for the above vacancy to work under the direction of the Chief Administrative Officer, who also acts as Clerk to the Governing Body. The person appointed will have responsibility for the administrative aspects of academic development, student registration, statistics, examination arrangements and the supervision of staff in these administrative sections.

Salary: SENIOR OFFICERS' Grade 1, £4,239 to £4,842. N.C. Conditions of Service.

Forms of application and further particulars from the Principal, West Bromwich College of Commerce and Technology, Wotton Road South, Wednesbury, West Midlands B80 9PE.

Applications to be returned by 20th October, 1975.

Belfast City Council

Community Services Officers

Community Services Section, TOWN CLERK'S DEPARTMENT

THE JOB

General community development work in field of recreation, education, housing planning and neighbourhood security. Information and intelligence services relevant to social needs. Development of physical facilities in the social and recreational field.

THE PERSON

Ability to work on own initiative within a team. Wide experience of community work. Preferably academic or professional qualifications.

THE SALARY

£3,426 to £4,936 per annum. Graduates or those similarly qualified without experience may be considered for training posts at £2,127-£2,525.

FURTHER INFORMATION

Telephone or arrange to see Mrs Doris Field, Principal Community Services Officer, City Hall, Belfast. Telephone: Belfast 2022. Ext. 21.

Application forms and conditions of appointment may be obtained from the Community Services Section, City Hall, Belfast, BT1 5GS. Completed forms must be returned to me, P.O. Box 234, City Hall, Belfast, BT1 5GS, not later than 31st October.

Interviewing will be by appointment.

WILLIAM J. JOHNSTON, Town Clerk.

CAREERS OFFICERS

£3,183 to £3,963 inclusive

To work in District Careers Offices. In teams comprising Senior Careers Officer, Careers Officer, Employment Officer and Assistant, plus clerical support.

If you are a qualified Careers Officer, able to bring energy, enthusiasm and adaptability to the range of duties involved, i.e. school/office interviews, group work, individual visits/visions and administration, then we would be delighted to receive your application.

Application forms and further details available from: Personnel Officer, Belmont House, 38 Market Square, Uxbridge, Middlesex UB8 1TR. Quoting Ref: E/20/11X.

Tel: Uxbridge 52211. Ext. 29.

Closing date: 24th October, 1975.

LONDON BOROUGH OF BROMLEY

ADMINISTRATION General continued

CHILSHIRE THE KING'S SCHOOL

Headmaster, Independent Preparatory School, Chilshire, Wiltshire. The school is seeking a Headmaster to take over the running of the school from the present Headmaster, who is retiring. The school is a day school for boys, aged 3 to 13, with a total of 100 pupils. The school is situated in a beautiful area, and has a long history of excellence. The Headmaster will be responsible for the overall running of the school, and will be expected to bring a high level of achievement in all areas of the curriculum. The salary is £12,000 per annum, plus a house and other benefits. Applications should be sent to the Chairman of Governors, Chilshire School, Chilshire, Wiltshire.

EASTERN ARTS ASSOCIATION

30 Station Road, London E11 1JH. The Association is seeking a Secretary to take over the running of the Association from the present Secretary, who is retiring. The Association is a voluntary organisation, and is concerned with the promotion of the arts in the East of London. The Secretary will be responsible for the day-to-day running of the Association, and will be expected to bring a high level of achievement in all areas of the Association's work. The salary is £10,000 per annum, plus a house and other benefits. Applications should be sent to the Chairman of the Association, Eastern Arts Association, 30 Station Road, London E11 1JH.

GLASGOW SCOTCH SCHOLARSHIP SOCIETY

100, Queen's Road, Glasgow G1 1JH. The Society is seeking a Secretary to take over the running of the Society from the present Secretary, who is retiring. The Society is a voluntary organisation, and is concerned with the promotion of the Scottish language and culture in Glasgow. The Secretary will be responsible for the day-to-day running of the Society, and will be expected to bring a high level of achievement in all areas of the Society's work. The salary is £10,000 per annum, plus a house and other benefits. Applications should be sent to the Chairman of the Society, Scottish Scholarship Society, 100, Queen's Road, Glasgow G1 1JH.

LONDON, S.W.1

P.A. required by chief executive of a large, multi-national company. The person appointed will be responsible for the day-to-day running of the company, and will be expected to bring a high level of achievement in all areas of the company's work. The salary is £12,000 per annum, plus a house and other benefits. Applications should be sent to the Chairman of the company, London, S.W.1.

YORKSHIRE REGIONAL EXAMINATIONS BOARD

Applications for the post of Administrative Officer. The person appointed will be responsible for the day-to-day running of the Board, and will be expected to bring a high level of achievement in all areas of the Board's work. The salary is £10,000 per annum, plus a house and other benefits. Applications should be sent to the Chairman of the Board, Yorkshire Regional Examinations Board, York.

YORKSHIRE REGIONAL EXAMINATIONS BOARD

Applications for the post of Administrative Officer. The person appointed will be responsible for the day-to-day running of the Board, and will be expected to bring a high level of achievement in all areas of the Board's work. The salary is £10,000 per annum, plus a house and other benefits. Applications should be sent to the Chairman of the Board, Yorkshire Regional Examinations Board, York.

Educational Psychologists

CITY OF BIRMINGHAM

EDUCATION AND SOCIAL SERVICES DEPARTMENT

PSYCHOLOGIST

Applications are invited from qualified Educational Psychologists for the post of Educational Psychologist. The person appointed will be responsible for the day-to-day running of the department, and will be expected to bring a high level of achievement in all areas of the department's work. The salary is £10,000 per annum, plus a house and other benefits. Applications should be sent to the Chairman of the department, City of Birmingham Education and Social Services Department, Birmingham.

COUNTY OF NORTH YORKSHIRE

ADVISER FOR COMMUNITY EDUCATION

Salary Scale - Southbury - £8,210-£9,320

Applications are invited from men and women for the post of ADVISER FOR COMMUNITY EDUCATION. The County Council has agreed that on the retirement of the present County Youth Officer a new post shall be created of Adviser for Community Education.

The person appointed should have specialist knowledge and experience of the Youth Service together with knowledge and sympathy for Adult Education such as will enable him or her to make a major contribution to the development of a Community Education Service in North Yorkshire. The salary scale will be subject to review in the light of any Southbury arbitration decision.

Application forms (reference D808), to be returned by the 24th October, 1975, and further details are available from the County Education Officer, County Hall, Northallerton, North Yorkshire DL7 8AE.

Somerset

Education and Cultural Services Committee

Area Careers Officer

for East Somerset

An Area Careers Officer is required for the East Somerset Area which includes Frome and Shepton Mallet. The salary will be in accordance with Grade AP 5 (£3,825-£4,095) and is currently under review.

Applications are invited from appropriately qualified candidates who should have previous experience in the Careers Service.

Application forms, and further details, are available from the Chief Education Officer (Staffing N.T.), County Hall, Taunton, to whom they should be returned by 24th October, 1975.

Lincolnshire

Careers Service

Divisional Careers Officer, Louth

SO1 £4,239-£4,545

The Lincolnshire Careers Service is charged with developing a service in which the work of Careers Officers, Careers Teachers in schools, and Careers Advisers in colleges is closely integrated.

Applicants for this post should be qualified and experienced Careers Officers.

The officer appointed will be based at Louth and will be responsible to the Principal Careers Officer for the management of the Divisional staff and for the general development of the service in the Division, including a degree of responsibility for the development of careers work in the schools and colleges. He or she will have a reduced case load of pupils and students as compared with the Careers Officers in the staff.

Applicants must be able to drive and an essential part of the allowance is payable. The County Council has agreed a scheme of removal and subsistence allowances payable in appropriate cases.

Application forms and further details are available from the Director of Personnel and Central Services, County Offices, Lincoln (Tel: Lincoln 2901, Extn. 371) to whom completed forms should be returned by 24 October, 1975.

Lincolnshire

Careers Service

Divisional Careers Officer, Louth

SO1 £4,239-£4,545

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EXAMINERS Appointments continued

LONDON THE UNIVERSITY

UNIVERSITY ENTRANCE AND SCHOOL EXAMINATIONS

GENERAL CERTIFICATE OF EDUCATION

The Council invites applications for the post of Examiner in the following subjects: English, Mathematics, Science, History, Geography, Modern Languages, Music, Art, and Physical Education. The Council is seeking experienced examiners who will be responsible for the day-to-day running of the examinations, and will be expected to bring a high level of achievement in all areas of the Council's work. The salary is £10,000 per annum, plus a house and other benefits. Applications should be sent to the Chairman of the Council, University Entrance and School Examinations, London.

STAFFORDSHIRE COUNTY COUNCIL

EDUCATION COMMITTEE

EDUCATION OFFICER

Applications are invited for the post of Education Officer. The person appointed will be responsible for the day-to-day running of the committee, and will be expected to bring a high level of achievement in all areas of the committee's work. The salary is £10,000 per annum, plus a house and other benefits. Applications should be sent to the Chairman of the committee, Staffordshire County Council, Stoke-on-Trent.

Metropolitan Regional Examinations Board

Applications for the post of Administrative Officer. The person appointed will be responsible for the day-to-day running of the Board, and will be expected to bring a high level of achievement in all areas of the Board's work. The salary is £10,000 per annum, plus a house and other benefits. Applications should be sent to the Chairman of the Board, Metropolitan Regional Examinations Board, London.

Metropolitan Regional Examinations Board

Applications for the post of Administrative Officer. The person appointed will be responsible for the day-to-day running of the Board, and will be expected to bring a high level of achievement in all areas of the Board's work. The salary is £10,000 per annum, plus a house and other benefits. Applications should be sent to the Chairman of the Board, Metropolitan Regional Examinations Board, London.

PRINCIPAL - £7000 to £9320

Residential Training Establishment

The Electricity Council is the central co-ordinating body for the electricity supply industry which employs some 170,000 staff in a wide variety of technical, commercial, administrative and other work.

Applications are invited for a new senior appointment as Principal of the Council's residential training establishment at East Horsley in Surrey.

The establishment is part of the Education and Training Branch of the Council's Industrial Relations Department and provides a range of management, executive development and specialist courses for staff employed in the industry.

The establishment now needs to develop the staff college aspects of its work, to concentrate increasing attention on management training, and to play a growing part in the design, development and programming of courses.

The Principal will manage all aspects of the establishment's business within the framework of the Education and Training Branch and of the Council's policies and practices.

CAREERS OFFICERS STOP A MINUTE!

Surrey has one of the largest careers services in the country with more than 100 staff, committed to development and growth of this important activity.

Surrey has much to offer its careers officers, including the specialist services of a careers information and research officer and training officer based at H.Q.

We currently have three opportunities open to experienced careers officers preferably qualified with a degree and diploma in vocational guidance or equivalent. All posts are graded SO1 (£4,239-£4,545) plus £180 Surrey Allowance. Car mileage and subsistence expenses are payable, together with generous relocation expenses in approved cases. Temporary accommodation may be available.

WAKEFIELD (City of)

WAKEFIELD DISTRICT

EDUCATION COMMITTEE

EDUCATION OFFICER

Applications are invited for the post of Education Officer. The person appointed will be responsible for the day-to-day running of the committee, and will be expected to bring a high level of achievement in all areas of the committee's work. The salary is £10,000 per annum, plus a house and other benefits. Applications should be sent to the Chairman of the committee, Wakefield District Education Committee, Wakefield.

WAKEFIELD (City of)

WAKEFIELD DISTRICT

EDUCATION COMMITTEE

EDUCATION OFFICER

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WAKEFIELD (City of)

WAKEFIELD DISTRICT

EDUCATION COMMITTEE

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ELECTRICITY COUNCIL

Careers Officer

Further and Higher Education, Reigate

You'd join a team of three working in a range of colleges with students up to HNC level and part-time students including those at Adult Education Centre and the Open University. Previous experience of this specialist area of work is not essential.

DISTRICT CAREERS OFFICERS

(2 posts); Weybridge or Reigate

To be responsible to the Area Careers Officers and to manage the Service in these busy districts. These are new posts involving wide-ranging duties and an interesting caseload.

Further details and application forms from County Education Officer, County Hall, Kingston upon Thames KT1 2DJ. Tel: 01-546 1050, ext. 3488. Closing date October 22, 1975.

THINK ABOUT SURREY

Surrey has one of the largest careers services in the country with more than 100 staff, committed to development and growth of this important activity.

Surrey has much to offer its careers officers, including the specialist services of a careers information and research officer and training officer based at H.Q.

We currently have three opportunities open to experienced careers officers preferably qualified with a degree and diploma in vocational guidance or equivalent. All posts are graded SO1 (£4,239-£4,545) plus £180 Surrey Allowance. Car mileage and subsistence expenses are payable, together with generous relocation expenses in approved cases. Temporary accommodation may be available.

WAKEFIELD (City of)

WAKEFIELD DISTRICT

EDUCATION COMMITTEE

EDUCATION OFFICER

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WAKEFIELD (City of)

WAKEFIELD DISTRICT

EDUCATION COMMITTEE

EDUCATION OFFICER

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Head of Employment Rehabilitation Research Centre

Salary £5,680 to £7,450

The Employment Services Agency (ESA) under the Manpower Services Commission provides a country-wide employment rehabilitation service through its network of 26 Employment Rehabilitation Centres.

ESA is planning a full-time Research Centre to evaluate existing employment rehabilitation practices and to recommend how these should be improved or developed in the future. The Centre will be based in London and will be responsible for the development of the research programme and for the supervision of the research team.

Candidates should have the necessary qualifications and experience to work on a programme of research drawing on the latest techniques and practices from related disciplines and to develop a team into an effective research operation.

The Head will lead a multi-disciplinary team, drawing on such skills as occupational psychology, occupational medicine, sociology, statistics and rehabilitation. He/she need not be an expert in rehabilitation but relevant research experience in the employment, medical or social fields, or in the problems of disabled persons is likely to be vital.

The successful applicant will be in London for an initial period of several months before moving to Birmingham where the Research Centre will be situated. The appointment will be for three years with a possibility of renewal for a further two years. Starting salary above the minimum may be offered, depending on experience and qualifications.

Telephone or write to: Celia Hodson, PEK, 4 Grosvenor Place, London SW1. Tel: 01-235 7080 Ext 301.

PROFESSIONAL AND EXECUTIVE RECRUITMENT

Telephone or write to: Celia Hodson, PEK, 4 Grosvenor Place, London SW1. Tel: 01-235 7080 Ext 301.

